harman/kardon®

Designed to Entertain™

AVR 354

AUDIO/VIDEO RECEIVER
OWNER'S MANUAL

SAFETY INFORMATION

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. The A/V receiver's cabinet may be cleaned by gently wiping with a soft cotton or microfiber cloth. Do not use water or any liquid cleaners.
7. Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
11. Only use the attachments/accessories specified by the manufacturer.
12. Use only with a cart, stand, tripod, bracket or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Wet Location Marking

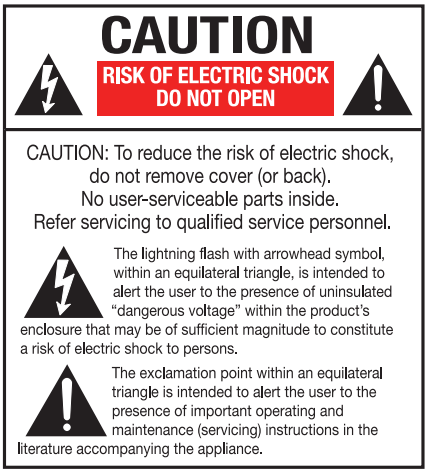
Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

Service Instructions

CAUTION – These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions, unless you are qualified to do so.

Outdoor Use Marking

WARNING – To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: To reduce the risk of electric shock,
do not remove cover (or back).
No user-serviceable parts inside.
Refer servicing to qualified service personnel.
The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.
The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Important Safety Information

Verify Line Voltage Before Use

Your AVR 354 has been designed for use with 120-volt AC current. Connection to a line voltage other than that for which it is intended can create a safety and fire hazard and may damage the unit.

If you have any questions about the voltage requirements for your specific model, or about the line voltage in your area, contact your selling dealer before plugging the unit into a wall outlet.

Do Not Use Extension Cords

To avoid safety hazards, use only the power cord attached to your unit. We do not recommend that extension cords be used with this product. As with all electrical devices, do not run power cords under rugs or carpets or place heavy objects on them. Damaged power cords should be replaced immediately by an authorized service center with a cord meeting factory specifications.

Handle the AC Power Cord Gently

When disconnecting the power cord from an AC outlet, always pull the plug; never pull the cord. If you do not intend to use the unit for any considerable length of time, disconnect the plug from the AC outlet.

Do Not Open the Cabinet

There are no user-serviceable components inside this product. Opening the cabinet may present a shock hazard, and any modification to the product will void your guarantee. If water or any metal object such as a paper clip, wire or staple accidentally falls inside the unit, disconnect it from the AC power source immediately, and consult an authorized service center.

CATV or Antenna Grounding

If an outside antenna or cable system is connected to this product, be certain that it is grounded so as to provide some protection against voltage surges and static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes and requirements of the grounding electrode.

NOTE TO CATV SYSTEM INSTALLER: This reminder is provided to call the CATV (cable TV) system installer's attention to article 820-40 of the NEC, which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as possible.

Installation Location

- To ensure proper operation and to avoid the potential for safety hazards, place the unit on a firm and level surface. When placing the unit on a shelf, be certain that the shelf and any mounting hardware can support the weight of the product.
- Make certain that proper space is provided both above and below the unit for ventilation. If this product will be installed in a cabinet or other enclosed area, make certain that there is sufficient air movement within the cabinet. Under some circumstances, a fan may be required.
- Do not place the unit directly on a carpeted surface.
- Avoid installation in extremely hot or cold locations, or in an area that is exposed to direct sunlight or heating equipment.
- Avoid moist or humid locations.
- Do not obstruct the ventilation slots on the top of the unit, or place objects directly over them.
- Due to the weight of the AVR 354 and the heat generated by the amplifiers, there is the remote possibility that the rubber padding on the bottom of the unit's feet may leave marks on certain wood or veneer materials. Use caution when placing the unit on soft woods or other materials that may be damaged by heat or heavy objects. Some surface finishes may be particularly sensitive to absorbing such marks, due to a variety of factors beyond our control, including the nature of the finish, cleaning materials used, and normal heat and vibration caused by the use of the product, or other factors. We recommend that caution be exercised in choosing an installation location for the component and in normal maintenance practices, as your warranty will not cover this type of damage to furniture.

Cleaning

When the unit gets dirty, wipe it with a clean, soft, dry cloth. If necessary, and only after unplugging the AC power cord, wipe it with a soft cloth dampened with mild soapy water, then a fresh cloth with clean water. Wipe it dry immediately with a dry cloth. NEVER use benzene, aerosol cleaners, thinner, alcohol or any other volatile cleaning agent. Do not use abrasive cleaners, as they may damage the finish of metal parts. Avoid spraying insecticide near the unit.

Moving the Unit

Before moving the unit, be certain to disconnect any interconnection cords with other components, and make certain that you disconnect the unit from the AC outlet.

Important Information for the User

This equipment has been tested and found to comply with the limits for a Class-B digital device, pursuant to Part 15 of the FCC Rules. The limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio-frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that harmful interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept interference received, including interference that may cause undesired operation.

NOTE: Changes or modifications may cause this unit to fail to comply with Part 15 of the FCC Rules and may void the user's authority to operate the equipment.

Unpacking

The carton and shipping materials used to protect your new receiver during shipment were specially designed to cushion it from shock and vibration. We suggest that you save the carton and packing materials for use in shipping if you move, or should the unit ever need repair.

To minimize the size of the carton in storage, you may wish to flatten it. This is done by carefully slitting the tape seams on the bottom and collapsing the carton. Other cardboard inserts may be stored in the same manner. Packing materials that cannot be collapsed should be saved along with the carton in a plastic bag.

If you do not wish to save the packaging materials, please note that the carton and other sections of the shipping protection are recyclable. Please respect the environment and discard those materials at a local recycling center.

It is important that you remove the protective plastic film from the front-panel lens. Leaving the film in place will affect the performance of your remote control.

STAPLE INVOICE HERE

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WARNING

To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

For Canadian model

This Class B digital apparatus complies with Canadian ICES-003.
For models having a power cord with a polarized plug:
CAUTION: To prevent electric shock, match wide blade of plug to wide slot, fully insert.

Modèle pour les Canadien

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
Sur les modèles dont la fiche est polarisee:
ATTENTION: Pour éviter les chocs électriques, introduire la lame la plus large de la fiche dans la borne correspondante de la prise et pousser jusqu'au fond.

INTRODUCTION

Please register your AVR 354 at www.harmankardon.com.

Note: You'll need the product's serial number. At the same time, you can choose to be notified about new products and/or special promotions.

WWW.HARMANKARDON.COM

Thank you for choosing Harman Kardon!

For more than fifty years, our mission has been to share our passion for music and entertainment, using leading-edge technology to achieve premium performance. To this end we invented the receiver, a single component designed to simplify home entertainment while maintaining the highest level of quality. Over the years our products have become easier to use, and have delivered superior value. The AVR 354 multizone 7.1-channel digital audio/video receiver carries this tradition forward, with some of our most advanced video processing capabilities yet, and a wealth of listening and viewing options.

To obtain the maximum enjoyment from your new receiver, we urge you to read this manual and refer back to it as you become more familiar with its features and their operation.

If you have any questions about this product, its installation or its operation, please contact your retailer or customer installer, or visit our Web site at www.harmankardon.com.

Harman Kardon® AVR 354 7.1-Channel Audio/Video Receiver

Audio Section

- 75 Watts x 7, per channel seven channels driven at full power at 8 ohms, 20Hz – 20kHz, <0.07% THD, 525 watts total
- High-current capability, ultrawide-bandwidth amplifier design with low negative feedback
- All-discrete amplifier circuitry
- Quadruple-crossover bass management
- 24-Bit, twin-core Cirrus Logic® CS 49700 DSP processor
- 192kHz/24-bit D/A conversion
- Sampling upconversion to 96kHz

Surround Modes

- Dolby® Digital EX, Dolby Digital Plus, Dolby TrueHD
- Dolby Pro Logic® II and IIx (Movie, Music and Game), up to 96kHz
- Dolby Virtual Speaker Version 2 (Reference or Wide, two-channel)
- Dolby Headphone Version 2, up to 96kHz
- DTS-HD, DTS-HD Master Audio™
- DTS® (5.1; DTS Stereo; DTS-ES® 6.1 Discrete and Matrix)
- DTS 96/24™ (DTS Stereo)
- DTS Neo:6® (Cinema 5- or 6-channel; Music 5- or 6-channel), up to 96kHz
- Logic 7® (Movie, Music and Game – 5.1 and 7.1), up to 96kHz
- 5- or 7-Channel Stereo, up to 96kHz
- Surround Off (DSP or Analog Bypass)

Audio Inputs

- AM/FM/XM®* tuner
- Analog Audio 1 through 5 (assignable)
- Front-panel Analog Audio (assignable)
- 6-/8-Channel Analog Audio (assignable)

Audio/Video Inputs

- Three Analog Video (assignable)
- Front-panel Analog Video (assignable)
- Three Component Video 100MHz (assignable)
- Three HDMI™ (V.1.3 with Deep Color and audio/video processing)
- Faroudja DCDi Cinema™ video processing
  - Transcodes composite and S-video to component video
  - Transcodes 480i video to component video format, with upscaling to 1080i
  - Transcodes 480i video to HDMI output, with upscaling up to 1080p
- The Bridge II for iPod** connectivity with audio/video playback

Digital Audio Inputs

- Coaxial: two rear-panel/one front-panel
- Optical: three rear-panel/one front-panel

Outputs

- 7.1-Channel preamp outputs
- Analog Audio 2 and 4
- Analog Video 2
- Video monitor (composite, S-video and component)
- Digital audio (one coaxial)
- HDMI (V.1.3 with Deep Color)
- Multizone audio: speaker- and two line-level (one dedicated, one shared with surround back channels)
- Headphone

Ease of Use

- EzSet/EQ™ automated setup (microphone supplied)
- Full-color user interface and setup menu, generated in high-definition video
- Two-line dot-matrix front-panel display
- Color-coded connections
- Programmable, learning 7-device main remote control (includes AVR control over The Bridge II)
- Source input renaming
- Lip Sync Delay (up to 180msec)
- RS-232 serial port for system upgrades
- Switched accessory power outlet
- Remote infrared (IR) input and output
- Zone 2 IR input and Carrier IR Output
- IEC detachable AC power cord for easy installation

Supplied Accessories

The following accessory items are supplied with the AVR 354. If any of these items are missing, please contact Harman Kardon customer service at www.harmankardon.com.

- System and Zone 2 remote controls
- EzSet/EQ microphone
- The Bridge II docking station for iPod

Made for iPod

- AM loop antenna
- FM wire antenna
- Six AAA batteries
- Two covers for front-panel jacks
- AC power cord

* XM antenna module and subscription to XM service required. Hardware and service sold separately. XM service is not available in Alaska or Hawaii.

** Compatible with most docking iPod models, 4G and later. Video and still-image viewing requires an iPod that supports video browsing.

FRONT-PANEL CONTROLS

Main Power Switch: This mechanical switch turns the power supply on or off. It is usually left pressed in (On position), and cannot be turned on using the remote control.

Standby/On Switch: This electrical switch turns the receiver on for playback, or leaves it in Standby mode for quick turn-on using this switch or the remote control.

Power Indicator: This LED has three possible modes:

- **Main Power Off:** When the AVR is unplugged or the Main Power Switch is off, this LED is off.
- **Standby:** The LED is amber, indicating that the AVR is ready to be turned on.
- **On:** The LED is white, when the AVR is on and operating normally.

NOTE: If the PROTECT message ever appears, turn off the AVR and unplug it. Check all speaker wires for a possible short. If none is found, bring the unit to an authorized Harman Kardon service center for inspection and repair before using it again.

Source List: Press this button to select a source device, which is a component where a playback signal originates, such as DVD, cable TV, satellite or the tuner.

Volume Knob: Turn this knob to raise or lower the volume.

Message Display: Various messages appear in this two-line display in response to commands and changes in the incoming signal. In normal operation, the current source name appears on the upper line, while the surround mode is displayed on the lower line. When the on-screen display menu system (OSD) is in use, the current menu settings appear.

Headphone Jack/EzSet/EQ Microphone Input: Plug a 1/4" headphone plug into this jack for private listening.

This jack is also used to connect the supplied microphone for the EzSet/EQ procedure described in the Initial Setup section. To begin EzSet/EQ, plug the supplied microphone into this jack, place the microphone at the listening position, and follow the directions given in the Speaker Setup-Automatic Setup-EzSet/EQ on-screen menu.

Surround Modes: Press this button to select a surround sound (e.g., multichannel) mode. The Surround Modes menu will appear on screen, and the menu line will appear in the front-panel display.

Use the front-panel or remote ▲/▼ Buttons to highlight a different menu line: Auto Select, Virtual Surround, Stereo, Movie, Music or Video Game. Each line represents a type of audio signal, and is set to the preferred surround mode that you manually select.

Press the OK Button when the menu line is highlighted, and the available surround mode options for the current signal will appear. Use the ▲/▼ Buttons to select the desired mode, and press the OK Button to engage it. Press the Back/Exit Button to exit the Surround Modes menu.

See the Advanced Functions section for more information on surround modes.

Analog Audio, Video and Digital Audio Inputs: Connect a source component that will only be used temporarily, such as a digital camera or game console, to these jacks. Use only one type of audio and one type of video connection.

NOTES:

- Each of these connections (analog audio, digital audio and video) may be independently assigned to any source. See the Initial Setup section for information on setting up sources, including assigning audio and video inputs to a source.
- Although these jacks are labeled Optical 4, Coaxial 3 and Video 4 on the AVR, the AVR's menus refer to them as the Optical Front, Coaxial Front, Composite Front, S-Video Front and Analog Front inputs.

Speaker/Channel Input Indicators: The box icons indicate which speaker positions you have configured (see the Initial Setup Section), and the size (frequency range) of each speaker. The letters will light inside the boxes to indicate which channels are present in the incoming signal.

Navigation: These buttons are used to navigate the AVR's menus and to operate the tuner.

Remote IR Sensor: This sensor receives infrared (IR) commands from the remote control. It is important to ensure that it is not blocked. If covering the sensor is unavoidable, such as when the AVR 354 is placed inside a cabinet, you may use an optional Harman Kardon HE 1000, or other infrared receiver, connecting it to the Remote IR Input on the AVR 354's rear panel. Alternatively, connect the Remote IR Output of another compatible component to the AVR 354's Remote IR Input. Point the remote at the other device's remote sensor, and the command will be transmitted to the AVR 354. An external IR "blaster" may also be used, positioned to point at this area.

AVR Settings Button: Press this button to access the AVR's main menu.

Info Settings Button: Press this button to directly access the AVR's Source Info submenu, which contains the settings for the current source.

Resolution: Each press of this button changes the AVR's video output resolution to these settings: 480i, 480p, 720p, 1080i or 1080p.

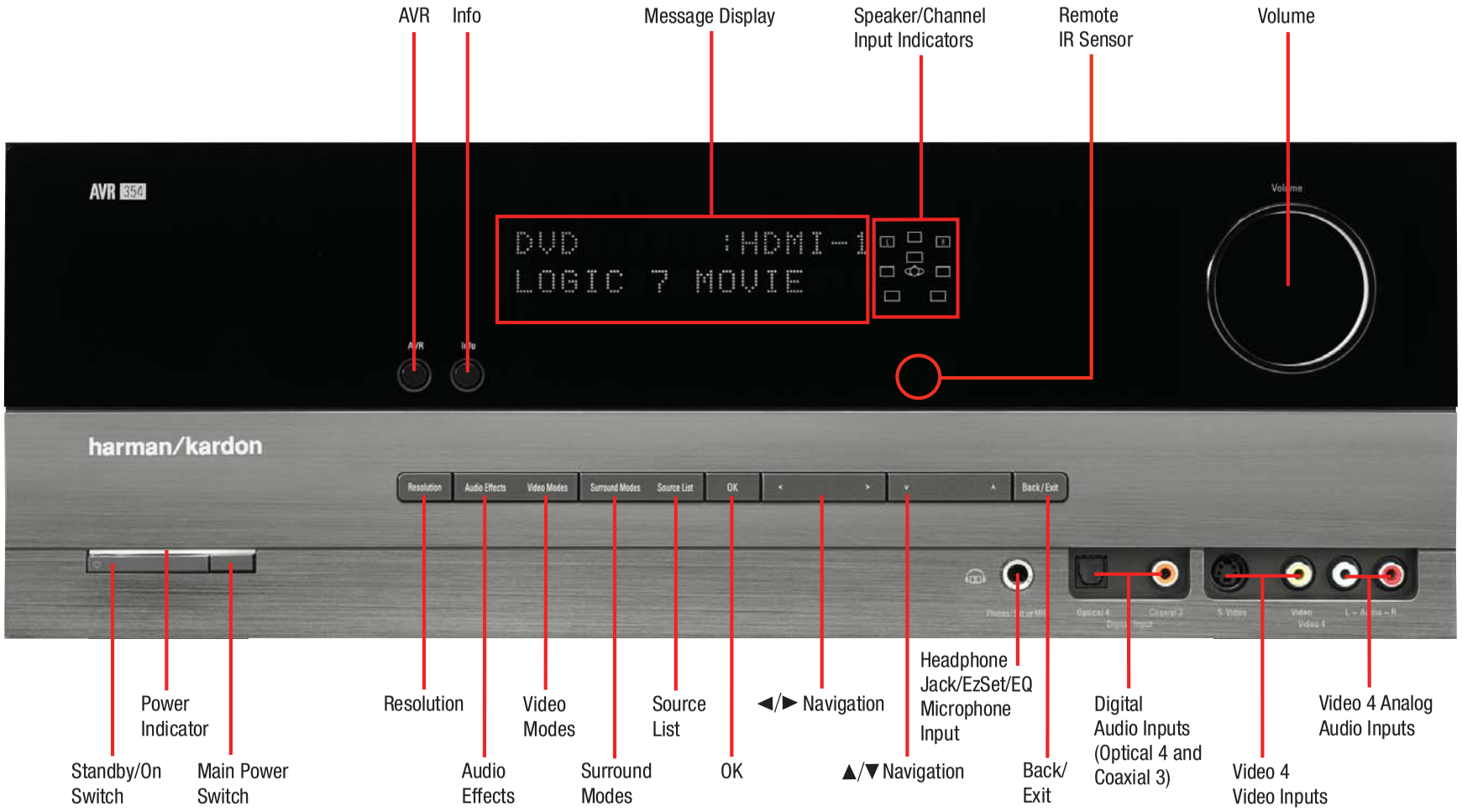
IMPORTANT NOTE: If the AVR's video output resolution is set higher than the capabilities of the actual connection, you will not see a picture. If the best video connection from the AVR to the TV is either composite or S-video, press this button until the resolution is set to 480i.

Audio Effects: Press this button to directly access the Audio Effects submenu, which allows adjustment of the tone and other controls. See the Initial Setup section for more information.

Video Modes: Press this button for direct access to the Video Modes submenu, which contains settings that may be used to improve the picture if necessary after you have adjusted the picture settings using the video display or TV.

OK: Press this button to select the currently highlighted item.

Back/Exit: Press this button to return to the previous menu, or to exit the menu system.



NOTE: To make it easier to follow the instructions throughout the manual that refer to this illustration, a copy of this page may be downloaded from the Product Support section at www.harmankardon.com.

REAR-PANEL CONNECTIONS

AM and FM Antenna Terminals: Connect the included AM and FM antennas to their respective terminals for radio reception.

XM Antenna Jack: Plug in an XM Connect and Play or Mini Tuner antenna module here. The XM antenna module is purchased separately, and should specify that it is for home use with an XM Ready® product. You will need to subscribe to the XM service, which is available separately, and activate the service for your antenna module. (XM service is not available in Alaska and Hawaii.)

Front, Center and Surround Speaker Outputs: Use two-conductor speaker wire to connect each set of terminals to the correct speaker. Remember to observe the correct polarity (positive and negative connections). Always connect the positive lead to the colored terminal on the receiver and the red terminal on the speaker. Connect the negative lead to the black terminal on both the receiver and the speaker. See the Connections section for more information on connecting your speakers.

Surround Back/Zone 2 Speaker Outputs: These speaker outputs are used for the surround back channels in a 7.1-channel home theater, or may be reassigned to a remote room for multizone operation. When these outputs are reassigned for multizone operation, only a 5.1-channel configuration will be available in the main listening room. Use the on-screen menu system to configure these channels as desired.

As with the other speaker outputs, remember to observe proper polarity by connecting the positive and negative output terminals to the corresponding terminals on each speaker.

Subwoofer Output: If you have a powered subwoofer with a line-level input, connect it to this jack.

Preamp Outputs: Connect these jacks to an external amplifier if more power is desired.

The Surround Back/Zone 2 Preamp Outputs may be used with an external amplifier to power the surround back channels, or to power the remote zone of a multizone system. Use the on-screen menu system to configure these channels as desired.

Remote Infrared (IR) Input and Output: When the remote IR receiver on the front panel is blocked, such as when the AVR is placed inside a cabinet, connect an optional IR receiver to the Remote IR Input jack for use with the remote control. The Remote IR Output may be connected to the Remote IR Input of a compatible product to enable remote control through the AVR. This is particularly useful in multizone applications to control a source device from the remote room (when used with the Zone 2 IR Input). When several source devices are used, connect them in "daisy chain" fashion.

Zone 2 Infrared (IR) Input: Connect a remote IR receiver located in the remote zone of a multizone system to this jack to control the AVR (and any source devices connected to the Remote IR Output) from the remote zone.

Remote IR Carrier Output: This output is similar in function to the Remote IR Output, with the difference that this jack outputs the full infrared signal as received by the AVR's IR sensor or the Remote IR Input, while the Remote IR Output jack outputs a "stripped" signal that has no carrier frequency. The full signal may be required by some components with IR inputs. It may also be required when you connect external IR emitters or other devices to the AVR to pass IR signals to other components.

Composite and S-Video 1, 2 and 3 Video Inputs: These jacks may be used to connect your video-capable source components (e.g., VCR, DVD player, cable TV box) to the receiver. Use only one type of video connection for each source. These inputs are assignable, which means they may be paired with any analog or digital audio inputs. This will be explained in more detail in subsequent sections of this manual.

> **NOTE:** The Video 2 inputs are associated with a set of outputs. Consider connecting a video recorder here.

Composite and S-Video 2 Outputs: Connect one of these analog video outputs to the composite or S-video inputs of a recording device. A signal is available at these outputs whenever an analog video source is playing. HDMI and component video signals are not available for recording.

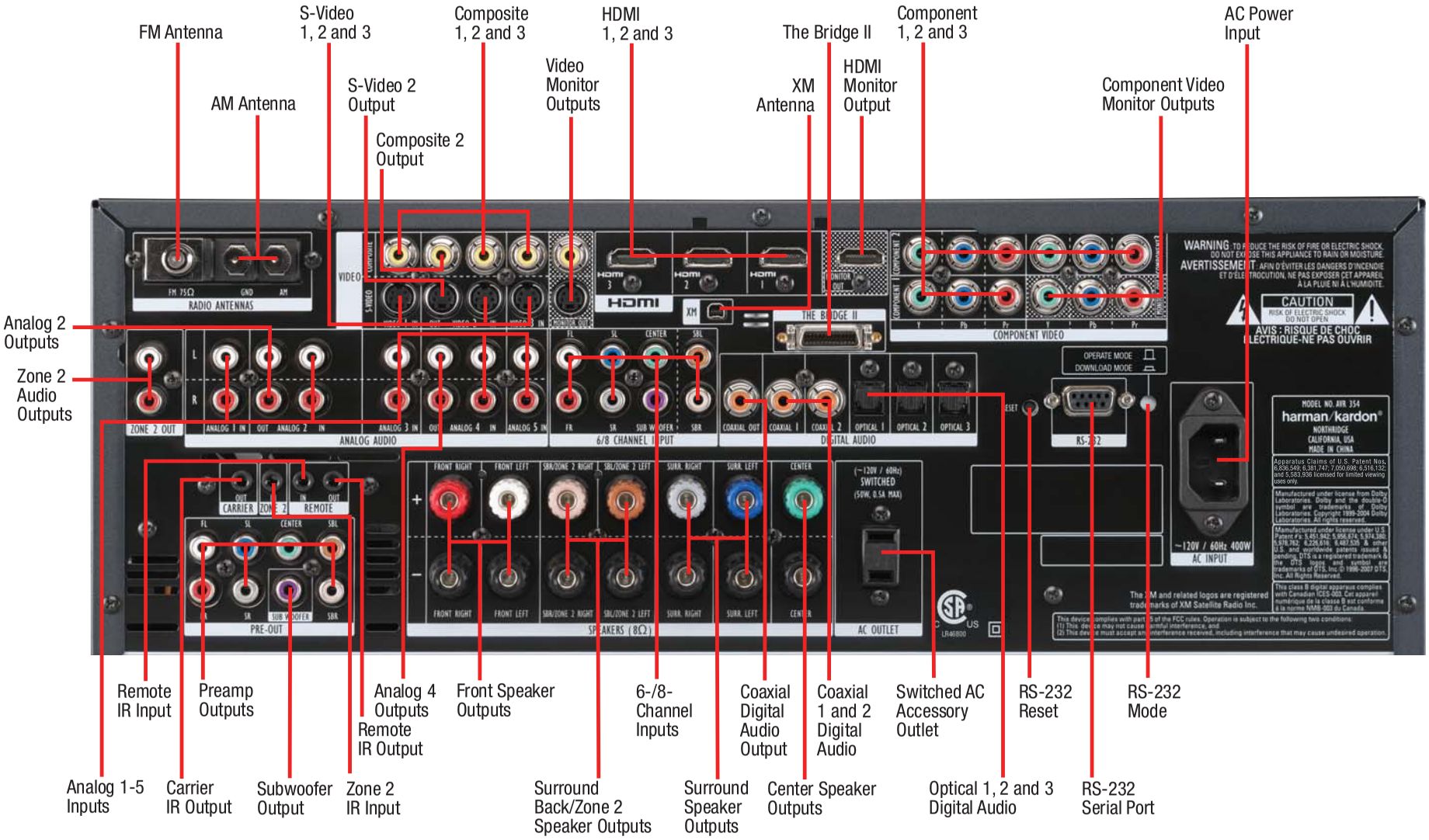
Composite and S-Video Monitor Outputs: If any of your sources use composite or S-video connections, connect one or both of these monitor outputs to the corresponding inputs on your television or video display. If your video display is equipped with HDMI or component video inputs, these connections are unnecessary. Connect the HDMI Monitor Output (if available, otherwise use the Component Video Monitor Output) to your TV, and the AVR 354 will convert the composite or S-video source signal to the correct format for a single video cable connection to the TV.

HDMI Inputs and Output: HDMI (High-Definition Multimedia Interface) is a connection for transmitting digital audio and video signals between devices. With the AVR 354's powerful processor, you may connect up to three HDMI-equipped source devices to the HDMI inputs using a single-cable connection, while benefiting from superior digital audio and video performance. If your video display is not HDMI-compatible, connect the device to one of the analog video inputs, then pair it with an analog or digital audio input.

If your video display has an HDMI input, make just the HDMI video connection to your display; the AVR 354 will automatically transcode analog video signals to the HDMI format, upscaling to as high as 1080p.

Analog 1–5: Connect the left and right analog audio outputs of a source device to any of these inputs. These inputs are assignable, which means they may be paired with any video inputs, as explained in subsequent sections of this manual.

> NOTES:
>
> - The Analog 3 through 5 connectors physically line up below the Video 1 through 3 (composite and S-video) connectors. For convenience, consider using Analog 3 with Video 1, Analog 4 with Video 2 and Analog 5 with Video 3, if appropriate for your system.



NOTE: To make it easier to follow the instructions throughout the manual that refer to this illustration, a copy of this page may be downloaded from the Product Support section at www.harmankardon.com. All connectors are inputs except as indicated.

REAR-PANEL CONNECTIONS

- The Analog 1 and 2 connectors don't physically line up with any analog video inputs. Consider using them for audio-only devices, such as a CD player or cassette tape deck.
- The Analog 2 and 4 inputs are each associated with a set of outputs. Consider using the Analog 2 connectors for an audio recorder, and the Analog 4 connectors for a video recorder (along with the Video 2 connectors).
- You may optionally connect a source to both an analog and digital audio input. This is useful for making recordings, for multizone applications or simply as a backup.

Analog 2 and 4 Outputs: Connect either of these analog audio outputs to the analog audio inputs of a recording device. A signal is available at these outputs whenever an analog audio source is playing. However, the AVR 354 does not convert digital audio sources to analog for recording.

Coaxial 1/2 and Optical 1/2/3 Digital Audio Inputs: If a source has a compatible digital audio output, and if you are not using an HDMI connection for audio for the device, connect it to one of these jacks to hear digital audio formats, such as Dolby Digital, DTS and linear PCM. Use only one type of digital audio connection for each source.

Coaxial Digital Audio Output: If a source is also an audio recorder, connect a coaxial digital audio output to the recorder's input for improved recording quality. Only PCM digital audio signals are available for recording.

The Bridge II Input: Connect the included Harman Kardon The Bridge II docking station to this input for use with most docking iPod models, 4G and later (not included). Make sure the receiver is turned off (in Standby mode) when connecting The Bridge II.

6-/8-Channel Inputs: Connect the multichannel analog audio outputs of a DVD-Audio, SACD™, Blu-ray Disc™ or HD-DVD™ player (or any other external decoder) to these jacks to enjoy these formats.

NOTE: When the multichannel player has an onboard digital decoder, it is not necessary to connect it to the 6-/8-Channel Analog Audio Inputs. Only a digital audio connection (HDMI, coaxial or optical) is needed.

Zone 2 Audio Outputs: Connect these jacks to an external amplifier to power the speakers in the remote zone of a multizone system. When these jacks are used, it is possible to have a full 7.1-channel system in the main listening room at the same time the multizone system is in use.

Component Video 1, 2 and 3 Inputs: If a video source (e.g., DVD player or HDTV tuner) has analog component video (Y/Pb/Pr) capability, and if you are not using an HDMI connection for the device, then connect the component video outputs of the source to one of the sets of component video inputs. Do not make any other video connections to that source.

Component Video Monitor Outputs: If you are using one of the Component Video Inputs and your television or video display is component-video-capable, and if you are not connecting the HDMI Output to your display, connect these jacks to the corresponding inputs on your video display.

NOTES:

- Due to copy-protection restrictions, there is no output at the Component Video Monitor Outputs for copy-protected sources.
- Composite and S-video signals are upscaled to as high as 1080i and available at these outputs. If your video display's best connection is component video, it is the only video connection required from the AVR to the display.

RS-232 Serial Port: This specialized connector may be used with your personal computer in case we offer a software upgrade for the receiver at some time in the future.

RS-232 Mode: Leave this switch popped out in the Operate position unless the AVR 354 is being upgraded.

RS-232 Reset: This switch is only used during a software upgrade. A standard processor reset is performed by pressing and holding the front-panel OK Button.

Switched AC Accessory Outlet: You may plug the AC power cord of one source device into this outlet, and it will turn on whenever you turn on the receiver. Do not use a source that consumes more than 50 watts of power.

AC Power Input: After you have made all other connections, plug the AC power cord into this receptacle and into an unswitched wall outlet.

MAIN REMOTE CONTROL FUNCTIONS

The AVR 354 remote is capable of controlling 7 devices, including the AVR itself and an iPod docked in the included The Bridge II. During the installation process, you may program the codes for each of your source components into the remote. Each time you wish to use the codes for any component, first press its Selector button. This changes the button functions to the appropriate codes.

Each Source Selector has been preprogrammed to control certain types of components, with only the codes specific to each brand and model changing, depending on which product code is programmed. The AUX Source Selector may be used for any of five device types: a CD player, an HDTV set-top box, a PVD recorder used with cable or satellite television, a TiVo® set-top box or a VCR. The device mode will depend on the product code programmed into the AUX Source Selector as described in the Initial Setup section. CD players use codes beginning with a 0, 1 or 2; VCRs use codes beginning with a 3 or 4; HDTV set-top boxes use codes beginning with a 6; PVDs use codes beginning with a 7 and TiVo set-top boxes use codes beginning with an 8. The remote automatically switches to the correct device mode, and it will operate the device as described in the function list in Table A13 in the appendix.

Similarly, the CBL/SAT Source Selector automatically selects cable or satellite television operation depending on the first digit of the product code: 0, 1 or 2 for cable and 3 or 4 for satellite boxes.

> **IMPORTANT NOTE:** All of the AVR 354's audio and video inputs are independently assignable. As explained in the Initial Setup section, it is necessary to set up each source, which includes selecting the inputs to which the device is physically connected. Any device may be connected to any compatible input and given any name (e.g., DVD or Game). The Source Selectors' device types may be changed. For example, the TV Source Selector may be reprogrammed to operate a DVD player.

Most of the buttons on the remote have dedicated functions, although the precise codes transmitted will vary depending on which source device has been selected for operation. Due to the wide variety of functions unique to various source devices, we have included only a few of the most-often used functions on the remote, including alphanumeric keys, transport controls, television-channel control, menu access and power on and off. Please refer to the descriptions below for more specific information.

Some buttons are only used to operate the AVR, and their functions are available at any time, even if the remote has been switched to another device's mode: AVR Power On and Off, Audio Effects, Video Modes, Surround Modes, Volume, Mute and Sleep Settings. Press the AVR Settings button near the bottom of the remote to return it to AVR mode.

Any given button may have different functions, depending on which component is being controlled. Some buttons are labeled with these functions. For example, the Page Up/Down Buttons are labeled for use as Channel Up/Down Buttons when controlling a television or cable box. See Table A13 in the appendix for listings of the different functions for each type of component.

IR Transmitter Lens: As buttons are pressed on the remote, infrared codes are emitted through this lens. Make sure it is pointing toward the component being operated.

AVR Power On Button: Press this button to turn on the AVR. The Master Power Switch on the AVR 354's front panel must first have been switched on.

Device Power Off Button: When the remote has been switched to a device's mode by pressing its Source Selector, press this button to turn off the device.

Device Power On Button: When the remote has been switched to a device's mode by pressing its Source Selector, press this button to turn on the device.

Mute Button: Press this button to mute the AVR 354's speaker and headphone outputs temporarily. To end the muting, press this button or adjust the volume. Muting is also canceled when the receiver is turned off.

AVR Power Off Button: Press this button to turn off the AVR 354.

Source Selectors: Press one of these buttons to select a source device, which is a component where a playback signal originates, e.g., DVD, CD, cable TV, satellite or HDTV tuner. This will also turn on the receiver and switch the remote's mode to operate the source device. The first press of the Radio Selector switches the AVR to the last-used tuner band (AM, FM or XM). Each successive press changes the band.

Audio Effects: This button is only used to operate the AVR. Press it to directly access the Audio Effects submenu, which allows adjustment of the tone and other controls. Each successive press scrolls to the next line in the menu. See the Initial Setup section for more information.

Video Modes: This button is only used to operate the AVR. Press it for direct access to the Video Modes submenu, which contains settings that may be used to improve the picture if necessary after you have adjusted the picture settings using the video display or TV. Each successive press scrolls to the next line in the menu. See the Advanced Functions section for more information.

Surround Modes: This button is only used to operate the AVR. Press it to directly access the Surround Modes submenu. Each successive press scrolls to the next line in the menu, or use the ▲/▼ Buttons to scroll to the next line: Auto Select, Virtual Surround, Stereo, Movie, Music or Video Game. Each menu line represents a type of audio signal, and is set to the preferred surround mode that you manually select.

Press the OK Button when the menu line is highlighted, and the available surround mode options for the current signal will appear. Use the ▲/▼ Buttons to select the desired mode, and press the OK Button to engage it. Press the Back/Exit Button to exit the Surround Modes menu and display the next higher menu in the hierarchy.

See the Advanced Functions section for more information on surround modes.

Sleep Settings Button: Press this button to activate the sleep timer, which turns off the receiver after a programmed period of time of up to 90 minutes. Each successive press increases the timer by 10 minutes, ending with the "Sleep Off" message.

MAIN REMOTE CONTROL FUNCTIONS

Volume Control: Press this button to raise or lower the volume.

Navigation (▲/▼/◀/▶) and OK Buttons: These buttons are used to make selections within the menu system. These buttons are also used to operate the tuner.

Alphanumeric Keys: Use these buttons to enter numbers for radio station frequencies or to select station presets. Use the alphabetic keys with other products as required. When prompted for a text entry, the first press of the key displays the first letter printed above the key. Each additional press displays the other letters. When the desired letter appears, wait a moment for it to be entered before moving to the next character.

Last Channel: When controlling a cable, satellite or HDTV set-top box or a TV, press this button to return to the previous television channel.

Activity: This button may be programmed to transmit a series of commands with a single press, which is useful for powering on all devices and selecting the correct settings on each device, or for selecting multi-digit channels with a single press. See the Advanced Functions section for more information on Activities.

Back/Exit: Press this button to return to the previous menu or to exit the menu system. This button may have the same effect with some source devices.

Menu Button: This button is used to display the main menu on some source devices. To display the AVR 354's main menu, press the AVR Settings Button.

Disc Menu: While a DVD is playing, press the DVD Source Selector, then this button, to display the disc's menu.

Teletext Buttons: Use these buttons with a Teletext-capable television if your broadcast, cable or satellite provider offers Teletext service. They are normally not used in North America. These buttons are also used to operate some source devices. See Table A13 in the appendix for details.

Channel/Page Control: When the tuner has been selected, this control selects a preset radio station. Press these buttons while operating a cable, satellite or HDTV set-top box or a television to change channels. The Page control may be available with some DVD players when playing a DVD Audio disc containing pages of images associated with a track.

Record Button: Use this button to make recordings when an audio or video recorder is in use.

AVR Settings Button: Press this button to display the AVR's Main Menu. It is also used to switch the remote's device mode from a source device to the AVR.

Info Settings Button: Press this button to display the AVR's Info Menu, which contains the settings for the current source.

Source Settings Button: Press a Source Selector and then this button to display a source device's settings menu.

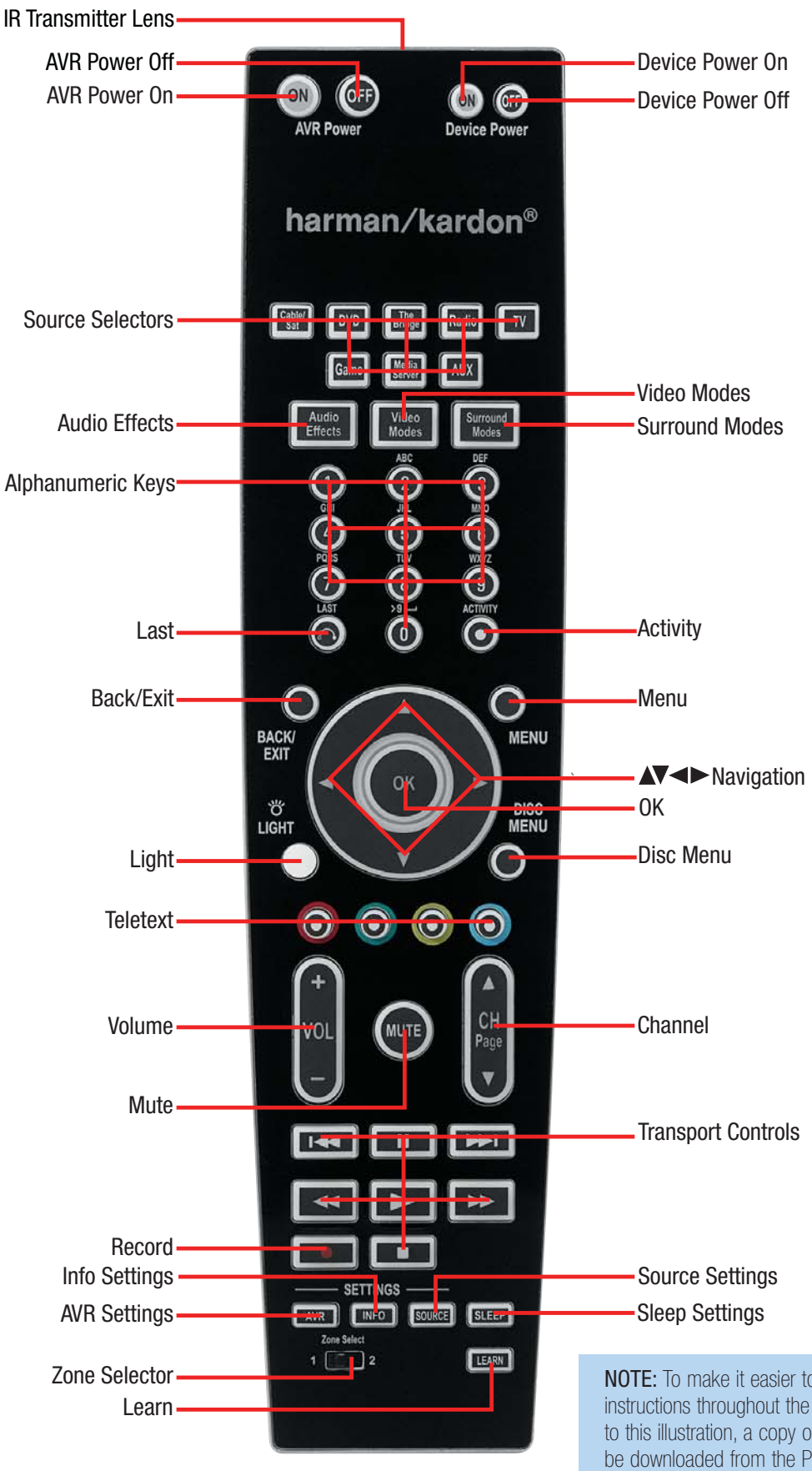
Zone Selector: Use this switch to select whether AVR commands will affect the main listening area (Zone 1) or the remote zone of a multizone system (Zone 2). For normal operation, leave the switch in the Zone 1 position.

Track Skip: These buttons have no effect on the receiver, but are used with source components to change tracks or chapters.

Transport Controls: These buttons have no effect on the receiver, but are used to control many source components.

Light: Press this button to illuminate the buttons on the remote. Press it again to turn the backlight off, or wait ten seconds after the last button press for the light to turn off on its own.

Learn: The AVR 354 remote is capable of "learning" individual IR codes from the original remote that came with your TV or a device that is connected to any of the source inputs. See Step Eight of the Installation section for instructions on learning remote codes.



NOTE: To make it easier to follow the instructions throughout the manual that refer to this illustration, a copy of this page may be downloaded from the Product Support section at www.harmankardon.com.

ZONE 2 REMOTE CONTROL FUNCTIONS

The Zone 2 remote is a simplified device for use in the remote room of a multiroom system with an IR receiver connected to the Multiroom IR Input. It may be used to control the power, volume and mute functions for the remote zone; select a source input for the remote zone and control a compatible Harman Kardon DVD, CD or tape player that is connected to one of the AVR's Remote IR Outputs.

The Zone 2 remote may also be used in the main listening room to directly control the AVR 354 and Harman Kardon DVD, CD or tape players. In that case the power, volume and mute controls will affect only the main listening area.

The Zone 2 remote requires two AAA batteries (included) that are installed in the battery compartment on the back of the remote. Gently pull down on the tab at the top of the battery compartment cover and pull the cover off the remote. Make sure to observe proper polarity by matching the + and – symbols on the remote to the corresponding symbols printed inside the compartment.

IR Transmitter: This button-shaped lens emits infrared codes when buttons on the remote are pressed. Make sure it is pointing toward the IR receiver when in the remote room, or the component being operated when used in the main listening room.

Power Off: Press this button to turn off the AVR 354. The Zone 2 remote has no Power On Button, since the AVR turns on its multiroom system automatically when any of the Input Selectors is pressed, even if the AVR itself is in Standby mode. When in the main listening room, press any Input Selector or the AVR Selector to turn on the AVR 354, as you would when using the main system remote.

Mute: Press this button to mute the AVR 354's remote zone speakers temporarily. To end the muting, press this button or adjust the volume, or turn off the multiroom system. Unless the remote is used in the main listening area, only the remote zone will be affected.

Source Selectors: Press one of these buttons to select a source device for the remote zone. It will also turn on the multiroom system and switch the remote to operate the source device. You may select a different source device than is in use in the main room. If you select the same source as the main room, then any commands sent to the source, such as changing radio stations or skipping tracks on a CD, will affect both zones. The first press of the Radio Selector switches the AVR to the last-used tuner band (AM, FM or XM). Each successive press changes the band.

> **NOTE:** The blank button to the left of the Radio Selector is not used, even though pressing it causes the Zone Indicator to light up.

Transport Controls: These buttons have no effect on the receiver, but are used to control many source components.

AVR Settings Button: Press this button to display the AVR's Main Menu. It is also used to switch the remote's device mode from a source device to the AVR.

Info Settings Button: Press this button to display the AVR's Info Menu, which contains the settings for the current source.

Sleep Settings Button: Press this button to activate the sleep timer, which turns off the receiver after a programmed period of time of up to 90 minutes. Each successive press increases the timer by 10 minutes, ending with the "Sleep Off" message.

Back/Exit: Press this button to return to the previous menu or to exit the menu system. This button may have the same effect with some source devices.

Menu Button: This button is used to display the main menu on some source devices. To display the AVR 354's main menu, press the AVR Settings Button.

Navigation (▲/▼/◀/▶) and OK Buttons: These buttons are used to make selections within the menu system. These buttons are also used to operate the tuner.

Zone Selector and Zone Indicator: Each press of the Zone Selector determines whether the AVR commands will affect the main listening area (Zone 1) or the remote zone (Zone 2). The Zone Indicator will turn green when Zone 1 has been selected, and red for Zone 2. The Zone Indicator will also light briefly whenever any button is pressed.

Volume Controls: Press these buttons to raise or lower the volume in the remote zone.

NOTE: To make it easier to follow the instructions throughout the manual that refer to this illustration, a copy of this page may be downloaded from the Product Support section at www.harmankardon.com.

INTRODUCTION TO HOME THEATER

The AVR 354 may be the first multichannel surround sound receiver you have owned. Although it has more connections and features than 2-channel receivers, many of the principles are similar and the new concepts are easy to understand. This introductory section will help you to familiarize yourself with the basic concepts, which will make setup and operation smoother.

If you are already familiar with home theater, you may skip this section and proceed to the Connections section on page 19.

Typical Home Theater System

A home theater typically includes an audio/video receiver, which controls the system; a DVD player; a source component for television broadcasts, which may be a cable box, a satellite dish receiver, an HDTV tuner or simply an antenna connected to the TV; a video display (television); and loudspeakers.

All of these components are connected using various types of cables for audio and video signals.

Multichannel Audio

The main benefit of a home theater system is that several loudspeakers are used in various locations around the room to produce "surround sound." Surround sound immerses you in the musical or film presentation for increased realism.

The AVR 354 may have up to seven speakers connected directly to it (plus a subwoofer). Each main speaker is powered by its own amplifier channel inside the receiver. When more than two speakers are used, it is called a multichannel system.

- **Front Left and Right –** The main speakers are used the same way as in a 2-channel system. However, you may notice that in many surround modes, these speakers are used more for ambient sound while the main action, especially dialogue, is moved to the center speaker.
- **Center –** The center speaker is usually placed above or below the video screen, and is used mostly for dialogue in movies and television programs. This placement allows the dialogue to originate near the actors' faces, for a more natural sound.
- **Surround Left and Right –** The surround speakers are used to improve directionality of ambient sounds. In addition, by using more loudspeakers in the system, more dynamic soundtracks may be played without risk of overloading any one speaker.
- **Surround Back Left and Right –** Additional surround speakers may be placed behind the listening position, improving the precision with which ambient sounds may be placed and allowing for more realistic-sounding pans. By using more speakers in the system, the same sound levels may be attained with less burden placed on any individual speaker.

  The surround back speakers may also be used with specialized surround modes that are designed for use with 7.1-channel systems, such as Dolby Digital EX, Dolby Digital Plus, Dolby TrueHD, DTS-ES (Discrete and Matrix), DTS-HD High Resolution Audio, DTS-HD Master Audio and Logic 7 (7.1 modes). However, the surround back speakers are optional. In fact, the AVR 354 enables you to set up a 5.1-channel system in your main listening area, and reassign the surround back channels for use with a multizone system, in which you use the surround back channels to power a pair of loudspeakers located in another room.

  Many people expect the surround speakers to play as loudly as the front speakers. Although all of the speakers in the system will be calibrated to sound equally loud at the listening position, most artists use the surround speakers for ambient effects only, and they program their materials to steer very little sound to these speakers.
- **Subwoofer –** A subwoofer is a special-purpose speaker designed to play only the lowest frequencies (the bass). It may be used to augment smaller, limited-range satellite speakers used for the other channels. In addition, many digital-format programs, such as movies recorded in Dolby Digital and other digital formats, may contain a special low-frequency effects (LFE) channel which is directed only to the subwoofer. The LFE channel packs the punch of a rumbling train or airplane, or the power of an explosion, adding realism and excitement to your home theater. Many people use two subwoofers, placed on the left and right sides of the room, for additional power and even distribution of the sound.

Surround Modes

There are different theories as to the best way to present surround sound and to distribute soundtrack information among the various speakers. A variety of algorithms have been developed in an effort to accurately reproduce the way we hear sounds in the real world. The result is a rich variety of surround mode options. Some modes are selected automatically, depending on the signal being received from the source. In many cases, you may select a surround mode manually.

Several companies have taken surround sound in slightly differing directions. It is helpful to group the numerous surround modes:

- **Dolby Laboratories Modes –** Dolby TrueHD, Dolby Digital Plus, Dolby Digital, Dolby Digital EX, Dolby Pro Logic II and IIx, Dolby Virtual Speaker, Dolby Headphone
- **DTS Modes –** DTS-HD, DTS-HD Master Audio, DTS, DTS-ES (Discrete and Matrix), DTS Neo:6, DTS 96/24
- **Harman International (the Harman Kardon parent company) Modes –** Logic 7
- **Stereo Modes –** Generic modes that expand upon conventional 2-channel stereo, including 5- and 7-Channel Stereo

Table A12 in the appendix contains detailed explanations of the differences between the various mode groups, and the mode options available within each group. Digital modes, such as Dolby Digital and DTS, are only available with specially encoded programs, such as HDTV, DVDs and digital cable or satellite television. Other modes may be used with various digital and analog signals to create a different surround presentation, or to use a different number of speakers. Surround mode selection depends upon the number of speakers in your system, the materials you are watching or listening to, and your personal tastes. Feel free to experiment.

There are different types of audio and video connections used to connect the receiver to the speakers and video display, and to connect the source devices to the receiver. To make it easier to keep them all straight, the Consumer Electronics Association has established the CEA® color-coding standard. See Table 1.

Table 1 – Connection Color Guide

Audio Connections		
	Left	Right
Front **(FL/FR)**		
Center **(C)**		
Surround **(SL/SR)**		
Surround Back **(SBL/SBR)**		
Subwoofer **(SUB)**		
Digital Audio Connections		
Coaxial		
Optical	Input	
Video Connections		
Component	Y Pb Pr	
Composite		
S-Video		
HDMI™ Connections (digital audio/video)		
HDMI		

Types of Connections

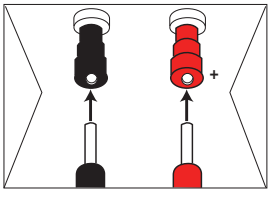
This section will briefly review different types of cables and connections.

Speaker Connections

Speaker cables carry an amplified signal from the receiver's speaker terminals to each loudspeaker. Speaker cables contain two wire conductors, or leads, inside plastic insulation. The two conductors are usually differentiated in some way, by using different colors, or stripes, or by adding a ridge to the insulation. Sometimes the wires are different, colors e.g. copper-colored and silver.

The differentiation is important because each speaker must be connected to the receiver's speaker-output terminals using two wires, one positive (+) and one negative (–), referred to as speaker polarity. It's important to maintain the proper polarity for all speakers in the system, or performance can suffer, especially for the low frequencies.

Always connect the positive terminal on the loudspeaker, which is usually colored red, to the positive terminal on the receiver, which is colored as shown in the Connection Color Guide (Table 1). Similarly, always connect the black negative terminal on the speaker to the black negative terminal on the receiver.



The AVR 354 uses binding-post speaker terminals that can accept banana plugs or bare-wire cables. Banana plugs are simply plugged into the hole in the middle of the terminal cap. See Figure 1.

Figure 1 – Binding-Post Speaker Terminals With Banana Plugs

Bare wire cables are installed as follows (see Figure 2):

1. Unscrew the terminal cap until the pass-through hole in the collar is revealed.
2. Insert the bare end of the wire into the hole.
3. Hand-tighten the cap until the wire is held snugly.

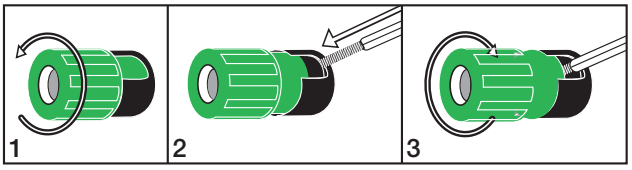


Figure 2 – Binding-Post Speaker Terminals With Bare Wires

Subwoofer

The subwoofer is a specialized type of loudspeaker used to play only the low frequencies (bass), which require much more power than the other speaker channels. In order to obtain the best results, most speaker manufacturers offer powered subwoofers, in which the speaker contains its own amplifier on board. Usually, a line-level (nonamplified) connection is made from the receiver's Subwoofer Output to a corresponding jack on the subwoofer, as shown in Figure 3, but sometimes the subwoofer is connected to the receiver using the front left and right speaker outputs, as with passive in-wall subwoofers, and then the front left and right speakers are connected to terminals on the subwoofer.

Although the subwoofer output looks similar to the analog audio jacks used for the various components, it is filtered and only allows the low frequencies to pass. Don't connect this output to any other devices. Although doing so won't cause any harm, performance will suffer.

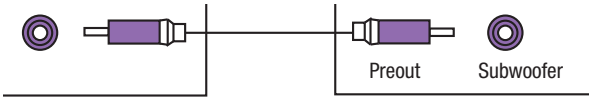


Figure 3 – Subwoofer

Connecting Source Devices to the AVR

The AVR 354 is designed to process audio and video input signals, playing back the audio and displaying the video on a television or monitor connected to the AVR. These signals originate in what are known as "source devices," including your DVD player, CD player, DVR (digital video recorder) or other recorder, tape deck, game console, cable or satellite television box or MP3 player. Although the tuner is built into the AVR, it also counts as a source, even though no external connections are needed, other than the FM and AM antennas and the XM antenna module.

Separate connections are required for the audio and video portions of the signal, except for digital HDMI connections. The types of connections used depend upon what's available on the source device, and for video signals, the capabilities of your video display.

CONNECTIONS

Audio Connections

There are two formats for audio connections: digital and analog. Digital audio signals are required for listening to sources encoded with digital surround modes, such as Dolby Digital and DTS, or for non-compressed PCM digital audio. There are three types of digital audio connections: HDMI, coaxial and optical. Any type of digital audio connection may be used for each source device, but never more than one for the same source. However, it's okay to make both analog and digital audio connections to the same source.

NOTE: Since HDMI signals may carry both audio and video, if your video display device has an HDMI input, make a single HDMI connection from your source device (such as a DVD player) to the AVR. No separate digital audio connection is usually required. Make sure to turn the volume on your television all the way down.

Digital Audio

The AVR 354 is equipped with three HDMI (High-Definition Multimedia Interface) inputs, and one output. HDMI technology enables digital audio and video information to be carried using a single cable, thus delivering the highest quality picture and sound.

There are different HDMI versions, depending on the capability of the source device and the type of signal it is capable of transmitting.

In addition, receivers and processors such as the AVR 354 may handle the incoming signal in several different ways, depending on their capability as well. The AVR 354 uses HDMI version 1.3a, and is capable of processing both the audio and video components of the HDMI data, minimizing the number of cable connections in your system. Thanks to the higher bandwidth and speed of HDMI version 1.3a, the AVR 354 implements Deep Color, which increases by an order of magnitude the shades of color that can be displayed; and the latest lossless multichannel audio formats, including Dolby TrueHD and DTS-HD Master Audio.

NOTE: Some DVD-Audio, SACD, Blu-ray Disc and HD-DVD players, output mulitchannel audio only through the source's multichannel analog outputs. For those devices, make a separate analog audio connection in addition to the HDMI connection, which is still used for video and to listen to Dolby Digital, DTS or PCM materials that may be stored on the disc.

In addition, the AVR 354 will convert analog video signals to the HDMI format, upscaling to high-definition 1080p resolution. You may view the AVR 354's own on-screen display menus using the HDMI output.

The physical HDMI connection is simple. The connector is shaped for easy plug-in (see Figure 4). If your video display has a DVI input and is HDCP-compliant, you may use an HDMI-to-DVI adapter (not included) to connect it to the AVR's HDMI Output, but a separate audio connection is required. HDMI cable runs are usually limited to about 10 feet, depending on the type of cable used.

Figure 4 – HDMI Connection

If your video display or source device is not HDMI-capable, use one of the analog video connections (composite, S- or component video) and, if available on your source device, either a coaxial or optical digital audio connection.

Coaxial digital audio jacks are usually color-coded in orange. Although they look similar to analog jacks, they should not be confused, and you should not connect coaxial digital audio outputs to analog inputs or vice versa. See Figure 5.

Figure 5 – Coaxial Digital Audio

Optical digital audio connectors are normally covered by a shutter to protect them from dust. The shutter opens as the cable is inserted. Input connectors are color-coded using a black shutter, while outputs use a gray shutter. See Figure 6.

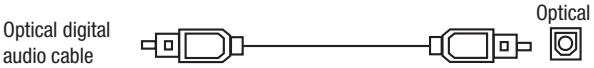


Figure 6 – Optical Digital Audio

Analog Audio

Analog connections require two cables, one for the left channel (white) and one for the right channel (red). These two cables are often attached to each other for most of their length. See Figure 7.

Most sources that have digital audio jacks also have analog audio jacks, although some older types of sources, such as tape decks, only have analog jacks. For sources that are capable of both digital and analog audio, you may make both connections.

The analog audio connection is strongly recommended if you intend to use the source with the multizone system. It's required if you will be using the multizone preamp outputs with an external amplifier to power your remote speakers, as the AVR 354's multizone system is not capable of converting the digital signal to analog format. It's suggested that you also use the analog audio connections when using the Surround Back/Zone 2 speaker outputs, in case another two-channel digital audio source is in use in the main listening area. The AVR 354 is only capable of processing one PCM source at a time.

You may only record materials from DVDs or other copy-protected sources, using analog connections. Remember to comply with all copyright laws, if you choose to make a copy for your own personal use.

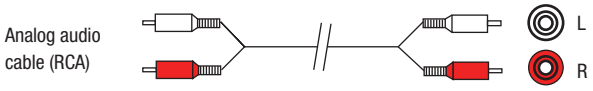


Figure 7 – Analog Audio

Multichannel analog connections are used with some high-definition sources where the copy-protected digital content is decoded inside the source. These types of connections are usually used with DVD-Audio, SACD, Blu-ray Disc, HD-DVD and other multichannel players. See Figure 8. However, the multichannel analog audio connection is not

required for DVD-Audio players compliant with HDMI version 1.1 or better, or HD-DVD and Blu-ray Disc players that decode the digital audio internally and output linear PCM signals in digital format. Consult the owner's guide for your disc player for more information.

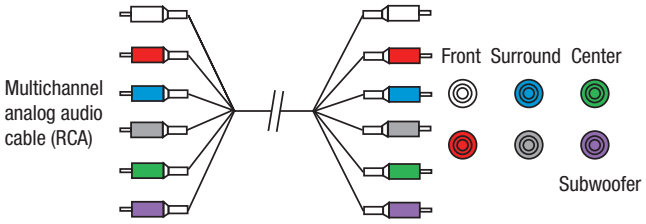


Figure 8 – Multichannel Analog Audio

Harman Kardon receivers also include a proprietary, dedicated audio connection called The Bridge II. If you own a docking iPod (most models, 4G or later), connect The Bridge II (included) to The Bridge II port on the receiver. See Figure 9. Dock your iPod (not included) in The Bridge II, and you may listen to your audio materials through your high-performance audio system. You may view still images or video materials stored on a photo- or video-capable iPod that supports video browsing. You may even use the AVR 354 remote to control the iPod with navigation messages displayed on the front panel and on a video display connected to the AVR. The Bridge II outputs analog audio to the AVR 354, and it is available to the multiroom system.

Figure 9 – The Bridge II

Video Connections

Although some sources only produce an audio signal (e.g., CD player, tape deck), many sources output both audio and video signals (e.g., DVD player, cable television box, HDTV tuner, satellite box, VCR, DVR). In addition to the audio connection, make one type of video connection for each of these sources (only one at a time for any source).

Digital Video

If you have already connected a source device to one of the HDMI inputs as explained in the Digital Audio Connections section, you have automatically made a video connection at the same time, as the HDMI signal includes both digital audio and video components.

If the source device is not capable of transmitting its digital audio signal through the HDMI connection, use one of the coaxial or optical digital audio inputs for the source.

If a multichannel analog audio connection is required for certain lossless formats (e.g., DVD-Audio, SACD, Blu-ray Disc or HD-DVD), you may make both audio connections. To listen to the multichannel disc, set the Audio Auto Polling setting to the 6/8CH inputs, and the AVR will automatically select it when no digital signal is output by the player.

Analog Video

There are three types of analog video connections: composite video, S-video and component video.

Composite video is the basic connection most commonly available. The jack is usually color-coded yellow, and looks like an analog audio jack, although it is important never to confuse the two. Do not plug a composite video cable into an analog or coaxial digital audio jack, or vice versa. Both the chrominance (color) and luminance (intensity) components of the video signal are transmitted using a single cable. See Figure 10.

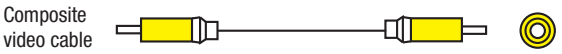


Figure 10 – Composite Video

S-video, or "separate" video, transmits the chrominance and luminance components using separate wires contained within a single cable. The plug on an S-video cable contains four metal pins, plus a plastic guide pin. Be careful to line up the plug correctly when you insert it into the jack on the receiver, source or video display. See Figure 11.

Figure 11 – S-Video

Component video separates the video signal into three components – one luminance ("Y") and two sub-sampled color signals ("Pb" and "Pr") – that are transmitted using three separate cables. The "Y" cable is color-coded green, the "Pb" cable is colored blue and the "Pr" cable is colored red. See Figure 12.

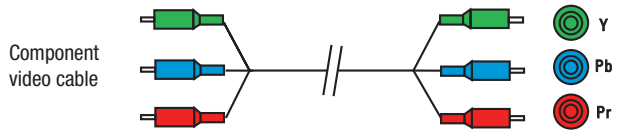


Figure 12 – Component Video

If it's available on your video display, an HDMI connection is recommended as the best quality connection, followed by component video, S-video and then composite video.

NOTES:

- Copy-protected sources are not available at the Component Video Monitor Outputs.
- Standard and high-definition analog video signals are upscaled to 1080i resolution for the Component Video Monitor Outputs. For improved video performance, consider upgrading to an HDMI-capable video display with 1080p resolution.

Antennas

The AVR 354 uses separate terminals for the included FM and AM antennas that provide proper reception for the tuner.

CONNECTIONS

The FM antenna uses a 75-ohm F-connector. See Figure 13.

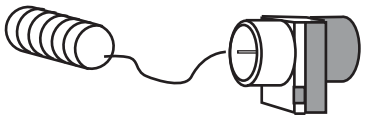


Figure 13 – FM Antenna

The AM loop antenna needs to be assembled. Connect the two leads to the spring terminals on the receiver. As AM antenna leads have no polarity, it doesn't matter which of the two terminals is used for either lead. See Figure 14.

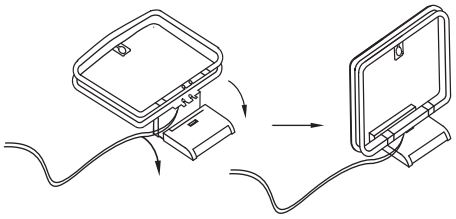


Figure 14 – AM Antenna

To enjoy XM satellite radio, purchase an XM antenna module designed for use with XM Ready devices and a subscription to the XM service. We recommend the XM Mini Tuner and Home Dock Bundle, available at www.xmradio.com. The older Connect and Play module is also compatible with the AVR 354, but it may no longer be available in your area.

An XM Ready-compatible module uses the special connector on the AVR 354's rear panel that allows you to use the AVR's tuner, including its 40 preset station locations and remote control. Although you may use a module with standard audio connections, which may be indicated for "car and home use," you will not be able to enjoy the AVR 354's ease of control.

RS-232 Serial Port

The RS-232 serial port on the AVR 354 is used only for software upgrades. If we release an upgrade for the receiver's operating system at some time in the future, it may be downloaded to the AVR using this port. Complete instructions will be provided at that time.

SPEAKER PLACEMENT

Before you begin to connect cables, it is important to place your speakers in their correct locations in the room.

Optimally, the speakers should be placed in a circle with the listening position at its center. The distance from the listening position to the video display forms the radius of the circle.

The speakers should be angled so that they directly face the listening position.

Front Speaker Placement

The center speaker is placed either on top of, below or mounted on the wall above or below the video display screen.

The front left and right speakers are placed along the circle, about 30 degrees from the center speaker and angled toward the listener.

It is best to place the front left/right and center speakers as close to the same height as possible, preferably at about the same height as the listener's ears. In any event, the center speaker should be no more than two feet above or below the left/right speakers.

Placement of the surround speakers depends on the number of speakers in your system. If you're using only two speakers with the AVR 354, place them in the front left and right positions, and skip to the Installation section. However, we recommend using the AVR 354 in a 5.1- or 7.1-channel configuration for optimal surround sound performance.

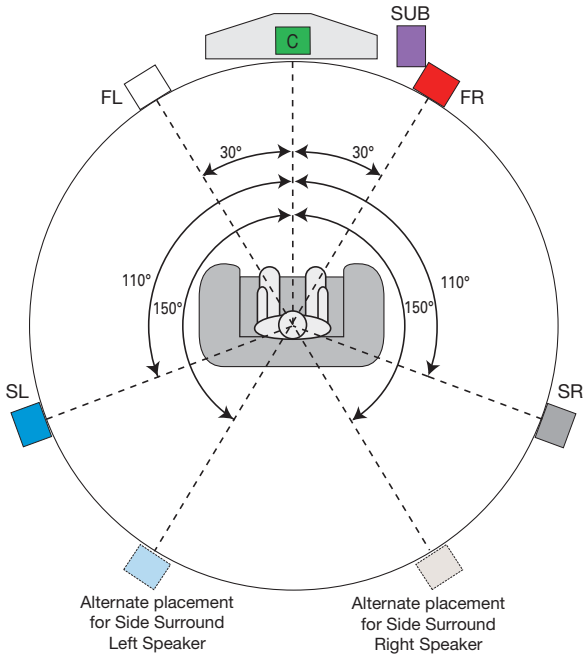


Figure 15 – Speaker Placement (5.1-Channel System)

Placement of Surround Speakers in a 5.1-Channel System

The side surround speakers should be placed 110 degrees from the center speaker, that is, slightly behind and angled toward the listener. If this isn't feasible, place them behind the listener, with each surround speaker facing the opposite-side front speaker. See Figure 15. The surround speakers may be placed a little higher than the listener's ears.

Placement of Surround Speakers in a 7.1-Channel System

In a 7.1-channel system, the side surround speakers are placed 90 degrees from the center speaker, directly to either side of the listening position. The surround back left and right speakers are placed 150 degrees from the center speaker, or directly facing the opposite-side front speaker. See Figure 16.

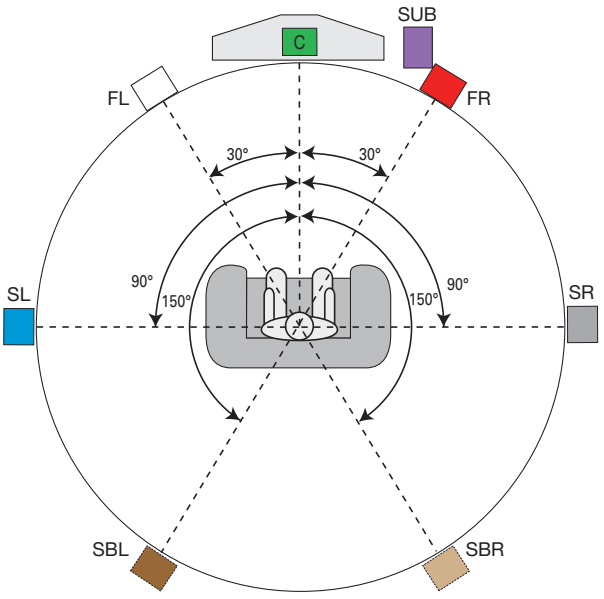


Figure 16 – Speaker Placement (7.1-Channel System)

NOTE: Some speaker manufacturers offer 6.1-channel speaker systems, which are compatible with 6.1-channel surround sound formats, such as Dolby Digital EX, DTS-ES Discrete and Matrix modes and DTS Neo:6 mode. We do not recommend using the AVR 354 in a 6.1-channel configuration. In fact, the 6.1-channel formats will sound better when played through a 7.1-channel system. The same surround back channel information is played through both surround back speakers, but with twice the power and clarity.

If you wish to use the AVR 354 with a 6.1-channel speaker system, place the single surround back speaker directly behind the listener, but do not connect it until after you have run the EzSet/EQ procedure for a 5.1-channel system. After the EzSet/EQ process finishes, connect the surround back speaker to the Surround Back Left Speaker Output. Then follow the directions in the Advanced Features section for manual setup of the surround back speaker.

SPEAKER PLACEMENT

Subwoofer Placement

The subwoofer's location is less critical, since low-frequency sounds are omnidirectional. Placing the subwoofer close to a wall or in a corner will reinforce the low frequencies, and may create a "boomy" sound. Experiment by placing the subwoofer where the listener normally sits and then walk around the room until the low frequencies sound best. Place the subwoofer in that spot.

In some installations it may be desirable to use two subwoofers for a 7.2-channel system. This is easily done by purchasing an optional Y-Adapter with one male RCA plug and two female RCA jacks. Connect the male jack to the Subwoofer output on the AVR's rear panel, and then run a standard interconnect cable from the Y-Adapter to the Line Input of each subwoofer. You may then place the two speakers as best suits the requirements of the room and your listening preferences.

NOTE: Your receiver will sound its best when the same model loudspeaker is used for all positions (other than the subwoofer). If that isn't possible, try to use speakers made by the same manufacturer.

You are now ready to connect the various components to the receiver. Before beginning, turn off all components, including the AVR 354, and unplug their power cords. **Don't plug in any of the power cords until you have finished making all of your connections.**

Remember that the receiver generates heat while it is on. Select a location that leaves several inches of space on all sides of the receiver. Avoid completely enclosing the receiver inside an unventilated cabinet. It is preferable to place components on separate shelves rather than stacking them directly on top of the receiver. Some surface finishes are delicate. Try to select a location with a sturdy surface finish.

Step One – Connect the Speakers

If you have not yet done so, place your speakers in the listening room, as described in the Speaker Placement section above.

Connect the center, front left, front right, surround left, surround right, surround back left and surround back right loudspeakers to the corresponding speaker terminals on the AVR 354. See Figure 17. Maintain the proper polarity by always connecting the positive and negative terminals on each speaker to the positive and negative terminals on the receiver. Use the Connection Color Guide on page 19 as a reference.

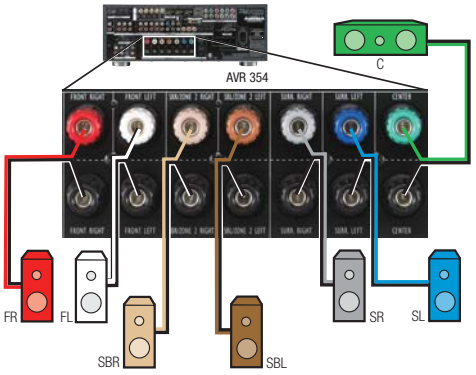


Figure 17 – Speaker Connections

NOTE: If you only have one surround back speaker, wait until after you have run the EzSet/EQ process in the Initial Setup section before connecting it to the Surround Back Left speaker outputs.

Step Two – Connect the Subwoofer

Connect the Subwoofer Output on the AVR 354 to the line-level input on your subwoofer. See Figure 18. Consult the manufacturer's guide for the subwoofer for additional information.

When the system has two subwoofers for a 7.2-channel system, use a Y-Adapter (not included) with one male RCA plug and two female RCA jacks. Connect the male plug to the Subwoofer Output, and connect each female jack to a cable that is then plugged into the line-level input on each subwoofer.

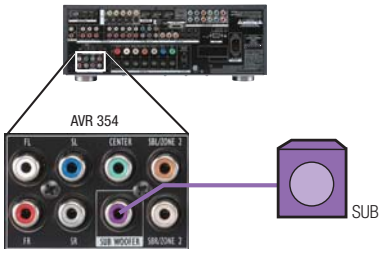


Figure 18 – Subwoofer Connection

Step Three – Connect the Antennas

Connect the FM and AM antennas to their terminals. If you have purchased an XM antenna module designed for connection to an XM Ready device, connect it now. To enjoy XM Radio, remember to purchase a subscription and activate your antenna module. More information is available at www.xmradio.com. See Figure 19.

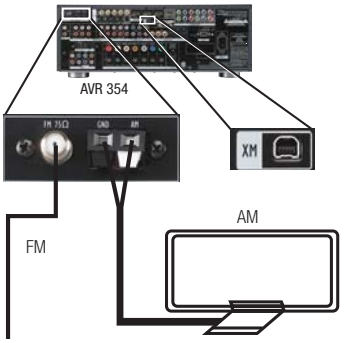


Figure 19 – Antenna Connections

Step Four – Connect the Source Components

A source is a device where the audio and video signals originate. Some sources, such as CD players, only offer audio, while sources used for watching movies or broadcast-television programming deliver a video signal as well.

Referring to the photograph of the AVR 354 remote control on page 15, there is a section of 8 buttons near the top of the remote designated "Source Selectors": Cable/Sat, DVD, Media Server, Radio, TV, Game, The Bridge and AUX. Each of these buttons corresponds to a "source input". The AVR 354's flexible design allows you to use almost any combination of audio and video connections for each source device. The goal of Step Four of the Installation is to match up each of your source devices, e.g., DVD player and cable television box, with the correct connectors on the AVR 354.

NOTE: This is not true of The Bridge II and the tuner, which use dedicated audio source signals, and a dedicated video signal when applicable for The Bridge II.

You may connect a source device to any appropriate input connectors. Note which audio and video inputs are used for each device in Table A5 in the appendix. Table A2 indicates the default input-connection assignments, any of which may be changed to match the actual connections in your system.

INSTALLATION

The precise connections to be made depend on the capabilities of the source device and your video display (TV). Select the best audio and video connections for each source. The types of connections are listed in order of preference:

HDMI Connections

- Choose the HDMI connection if it's available on your source device and your TV. An HDMI connection carries both digital audio and video, enabling a single-cable connection from the source device to the AVR. Except as noted below, no other audio or video connections are required.

NOTE: If your DVD-Audio, SACD, Blu-ray Disc or HD-DVD player is not capable of outputting multichannel digital audio through its HDMI output, make additional 6-/8-channel analog audio connections.

Audio Connections (for non-HDMI sources)

- Choose one digital audio connection: Optical or Coaxial
- Optional, or where digital audio is not available: Analog audio for making recordings for personal use or as a backup. Analog audio is required for older analog sources that don't have digital audio outputs, such as cassette decks.

Video Connections (for non-HDMI sources)

(choose only one, and make sure that type is available on your TV)

- Component video
- S-video
- Composite video

NOTES:

- If the video display is equipped with a DVI digital video input, make sure it is also HDCP-compliant (High-Bandwidth Digital Content Protection) to display copy-protected materials.
- If the source or video display has a DVI input, use an HDMI-to-DVI adapter (not included), and make separate audio connections.

Connect a DVD, SACD, Blu-ray Disc or HD-DVD Player

HDMI Video: If the DVD player and the TV both have an HDMI connector, connect the player as follows (see Figure 20):

- Connect the DVD player's HDMI output to the HDMI 1, 2 or 3 Input on the AVR.

Figure 20 – Connecting an HDMI-Equipped Disc Player

If the player is capable of playing multichannel discs, including DVD-Audio, SACD, Blu-ray Disc and HD-DVD, but it is not capable of outputting the multichannel audio through its HDMI output, make the following additional connections (see Figure 21):

- Connect the DVD player's 6-/8-channel analog audio outputs to the 6-/8-Channel Analog Audio Inputs on the AVR.

Figure 21 – Connecting a Multichannel Audio Player

Component Video: If the DVD player or the TV does not have an HDMI connector, but they both have component video connectors, connect the player as follows (see Figure 22):

- Connect the DVD player's component video output to the Component Video 1, 2 or 3 Input on the AVR.
- Connect one of the DVD player's digital audio outputs to one of the Coaxial or Optical inputs on the AVR.

Figure 22 – Connecting a Component-Video-Equipped Disc Player

If the player is capable of playing multichannel discs, including DVD-Audio, SACD, Blu-ray Disc and HD-DVD, make the following additional connection (see Figure 21):

- Connect the DVD player's 6-/8-channel analog audio outputs to the 6-/8-Channel Analog Audio Inputs on the AVR.

Composite/S-Video: If the best video connection common to both the DVD player and the TV is either S-video or composite video, follow these steps (see Figure 23):

- Connect the DVD player's S-video or composite video output (use one connection only) to the Video 1, 2 or 3 Input on the AVR. You may also use the Video 4 Composite or S-video Input located on the AVR's front panel (see Figure 31).
- Connect the DVD player's digital audio output to one of the Coaxial or Optical inputs on the AVR.

If the player is capable of playing multichannel discs, including DVD-Audio, SACD, Blu-ray Disc and HD-DVD, make the following additional connection (see Figure 23):

- Connect the DVD player's 6-/8-channel analog audio outputs to the 6-/8-Channel Analog Audio Inputs on the AVR.

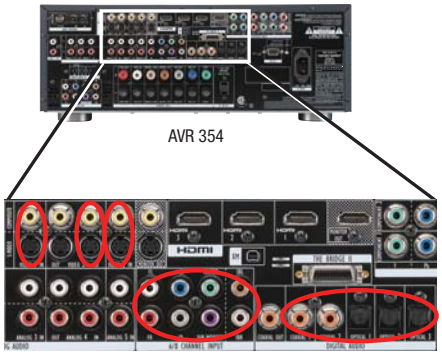


Figure 23 – Connecting a Composite- or S-Video-Equipped Disc Player

NOTES:

- Refer to Table A2 in the appendix for the default audio and video input assignments for each source. Using the default connections, if appropriate for your system, may save a few steps during Initial Setup. However, thanks to the AVR 354's flexibility, you may assign any audio and any video input to any source, as long as the assignments match the physical connections.
- If you wish to make recordings from a DVD, use an S-video or composite video input, and an Analog Audio input in addition to any other connections. The AVR cannot make recordings from HDMI or component video sources, and digital audio sources may only be recorded in two channels.

Connect an Audio/Video Recorder (PVD, DVR or TiVo)

HDMI Video: If the recorder and the TV both have an HDMI connector, connect the recorder as follows (see Figure 24):

- Connect the recorder's HDMI output to the HDMI 1, 2 or 3 Input on the AVR. This connection is for playback only, as the AVR cannot make recordings from HDMI sources.
- To make recordings, follow the instructions below for Composite/S-video recorders.

Figure 24 – Connecting an HDMI-Equipped Recorder

Component Video: If the recorder or the TV does not have an HDMI connector, but they both have component video connectors, connect the recorder as follows (see Figure 25):

- Connect the recorder's component video output to the Component Video 1, 2 or 3 Input on the AVR. This connection is for playback only, as the AVR cannot make recordings from component video sources.
- Connect the recorder's digital audio output to a Coaxial or Optical Input on the AVR (if available).
- Follow the instructions in the Composite/S-Video section for making connections required for recordings.

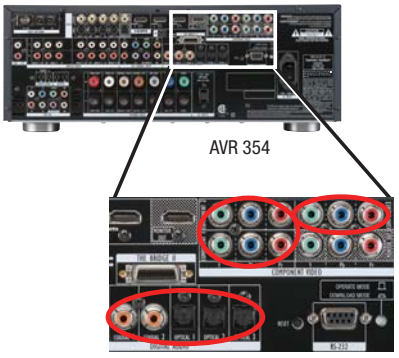


Figure 25 – Connecting a Component-Video-Equipped Recorder

Composite/S-Video: If the best video connection common to both the recorder and the TV is either S-video or composite video, or to make recordings, follow these steps, using only one type of video connection throughout (see Figure 26):

- Connect the recorder's S-video/composite video output to the Video 2 S-Video/Composite Video Input on the AVR.
- Connect the recorder's S-video/composite video input to the Video 2 S-Video/Composite Video Output on the AVR.
- Connect the recorder's analog audio outputs to the Analog 4 Audio Inputs on the AVR.
- Connect the recorder's analog audio inputs to the Analog 4 Audio Outputs on the AVR.

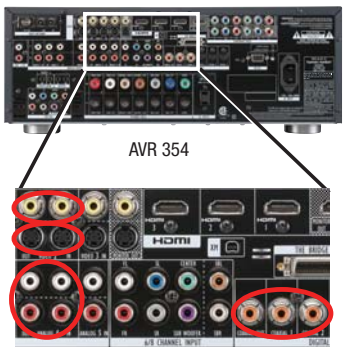


Figure 26 – Connecting a Composite or S-Video Recorder

- To make 2-channel digital audio recordings, connect the recorder's digital audio output to one of the Optical or Coaxial Inputs, and connect the AVR's Coaxial Digital Audio Output to the recorder's coaxial input. The AVR will convert an optical digital audio input signal to the proper format for recording via the Coaxial Digital Audio Output. See Figure 26.

Connect a Cable TV, Satellite, HDTV or Other Set-Top Box for Broadcast Television

NOTE: If the TV has a digital audio output, connect it to one of the digital audio inputs. If you use a direct cable connection to your TV, or an antenna connection with the TV's internal tuner, connect either the TV's digital audio output (if available) or its analog audio outputs to the AVR. See Step Five for information on connecting the receiver's video monitor outputs to the television.

HDMI Video: If the set-top box and the TV both have an HDMI connector, connect the set-top box as follows (see Figure 24):

- Connect the set-top's HDMI output to the HDMI 1, 2 or 3 Input on the AVR.

Component Video: If the set-top box or the TV does not have an HDMI connector, but they both have component video connectors, connect the set-top box as follows (see Figure 25):

- Connect the set-top's component video output to the Component Video 1, 2 or 3 Input on the AVR (if available).
- Connect the set-top's digital audio output to one of the Coaxial or Optical Inputs on the AVR (if available).

Composite S/Video: If the best video connection common to both the set-top box and the TV is either S-video or composite video, follow these steps (see Figure 27):

- Connect the set-top's S-video or composite video output (use one connection only) to the corresponding Video 1, 2 or 3 Input on the AVR.
- Connect the set-top's digital audio output to one of the Coaxial or Optical Inputs on the AVR (if available). For fully analog set-top boxes, connect the box's analog audio outputs to the AVR's Analog 1, 2, 3, 4 or 5 Audio Inputs.

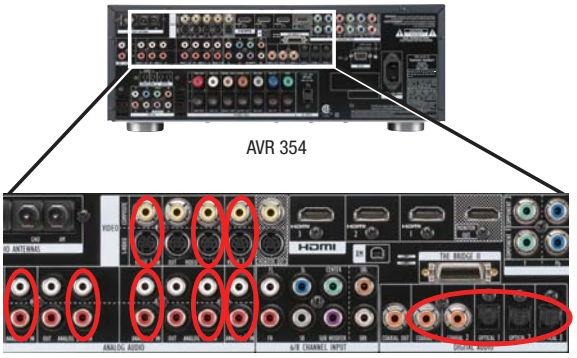


Figure 27 – Connecting a Composite- or S-Video-Equipped Set-Top Box

Connect a CD Player or Any Audio-Only Device

If the CD player or other component has a digital audio output, connect it to any available digital audio input on the AVR. If not, connect the CD player's left and right analog audio outputs to the Analog 1 or 2 Audio Inputs. No video connection is required, although the AVR will display any signal at the video input assigned to the same source as the audio inputs. See Figure 28.

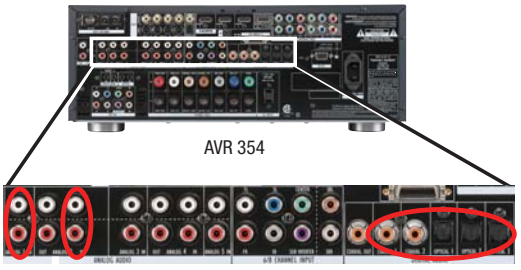


Figure 28 – Connecting a CD or Audio-Only Source

NOTES:

- A turntable may only be connected to the AVR if it is equipped with an internal phono preamp, or if you supply an external phono preamp, available at some audio specialty stores or through the Harman Kardon Parts Dept. You may then connect it to any set of analog audio inputs.
- Although there is no official source on the AVR 354 named CD, Phono or Audio, you may assign the audio device to an available source, such as TV (if the Cable/Sat source is in use for broadcast television), Game or AUX. See the Initial Setup section for more details on source assignment.

Connect a Tape Deck or Any Audio-Only Recorder

If the recorder has digital audio inputs and outputs, connect either its coaxial or optical digital audio output (not both) to the corresponding available input on the AVR, and connect the AVR's Coaxial Digital Audio Output to the recorder's coaxial digital audio input.

To make analog audio recordings, connect the recorder's left and right analog audio outputs to the Analog 2 Audio Inputs on the AVR, and the recorder's analog audio inputs to the AVR's Analog 2 Audio Outputs.

No video connection is required, although the AVR will display any signal at the video input assigned to the same source as the Analog 2 Audio Inputs. See Figure 29.

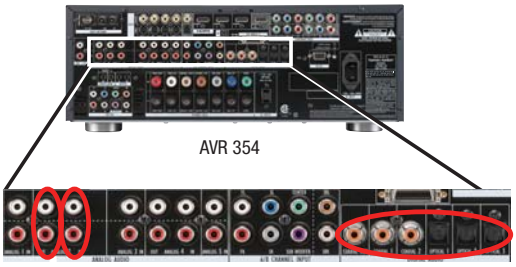


Figure 29 – Connecting an Audio Recorder

Connect an iPod Using The Bridge II Docking Station

The AVR 354 includes The Bridge II, a docking station compatible with most docking iPod models, 4G and later (not included). Enjoy audio and video content stored on the iPod, with all the power and fidelity of your home theater system. With The Bridge II, navigation and control of the iPod is a simple matter of using the preprogrammed AVR remote and following the on-screen menus. The system even charges the iPod when the AVR is powered on.

Simply plug the proprietary cable from The Bridge II into the special The Bridge II connector on the rear of the AVR 354. See Figure 30. Use the dock adapter supplied with the iPod, or obtain an adapter to avoid damaging The Bridge II or the Apple iPod during use.

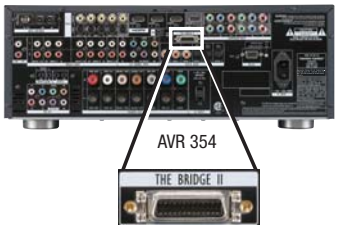


Figure 30 – The Bridge II Connector

NOTE: The original version of this accessory, known as The Bridge, is not compatible with the AVR 354. Should you misplace The Bridge II that is included with the AVR 354 in the future, contact Harman Kardon and make sure to order The Bridge II as a replacement.

Alternatively, or if you have another brand of portable audio player, use an interconnect with a stereo 1/8-inch mini-plug at one end and two RCA plugs at the other end to connect the player to the Audio Inputs on the AVR's front panel. See Figure 31.

Connecting a Game Console, Camera or Other Device

If a device will only be connected temporarily, you may use the audio/video inputs on the front panel. When not in use, place the supplied covers over the jacks for a cleaner appearance by snapping the covers in place. To remove the covers, gently press on the left side of each cover so that it pivots out.

Video Components: Install video components, e.g., game consoles and camcorders, as follows (see Figure 31):

- Connect the component's S-video or composite video output (use only one connection) to the corresponding front-panel Input on the AVR.
- Connect the component's optical or coaxial digital audio output to either the Optical or Coaxial Input on the front panel (if available). For fully analog devices, connect the device's analog audio outputs to the AVR's front-panel Analog Audio Inputs.

Figure 31 – Connecting a Device to the Front-Panel Inputs

Audio Components: Connect audio-only devices, such as CD players, to either the Coaxial or Optical Digital Audio Inputs, or the Analog Audio Inputs (see Figure 31).

NOTE: If your video devices are equipped with HDMI or component video outputs, you may connect them to any available audio and video input on the AVR.

Step Five – Connect the Video Display

IMPORTANT NOTE: Do not connect any video output on the video display (TV) to any video input on the AVR. Doing so will cause undesirable video interference.

HDMI Video: If the display has an HDMI input, connect the HDMI Monitor Output to the display (see Figure 32). Thanks to the AVR 354's sophisticated video processing and upscaling capabilities, no other video connections are required from the AVR to the video display. Analog video sources (composite, S-video and component) are converted to the HDMI format and upscaled to as much as 1080p resolution, depending on the display's capabilities. Proceed to Step Six.

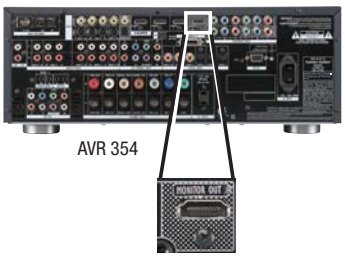


Figure 32 – HDMI Monitor Output

Component Video: If the display does not have HDMI inputs, but does have component video inputs, connect the Component Video Monitor Outputs to the display (see Figure 33). As with HDMI connections, the AVR 354 is capable of converting composite and S-video sources to the component video format, while upscaling the resolution to as high as 1080i, depending on the display's capabilities. Unlike HDMI connections, component video connections do not enable the AVR 354 to detect the display's capabilities and the appropriate resolution must be selected manually, as described in the Initial Setup section.

Figure 33 – Component Video Monitor Outputs

Composite/S-Video: If the video display does not have HDMI or component video inputs, connect the corresponding composite or S-video Monitor Output to the display. If available, S-video is preferred over composite video, and if used, the AVR 354 will convert composite video sources to S-video. See Figure 34.

Figure 34 – Composite and S-Video Monitor Outputs

Consult the manual for your TV to make sure you understand how to select the correct video input.

Step Six – Plug in AC Power

Having made all of your wiring connections, it is now time to plug each component's AC power cord into a working outlet.

You may plug one device into the AC Switched Accessory Outlet on the rear of the AVR 354. See Figure 35. Make sure this device draws no more than 50 watts. The device should have its mechanical or master power switch turned on, and it will power on any time the AVR 354 is turned on. If the device has a clock or must always be on, do not plug it into this outlet.

Figure 35 – Switched AC Accessory Outlet

Before plugging the AVR 354's AC Power Cord into an electrical outlet, make sure that the Master Power Switch on the front panel is popped out so that the word OFF appears on its top. Gently press the button to turn the switch off. This will prevent the possibility of damaging the AVR in case of a transient power surge.

The AVR 354 is equipped with a detachable power cord. It allows you to fully wire your system before installing the AVR, which may be required for some in-wall entertainment centers or custom applications. The male end of the cord should be plugged into an unswitched AC power outlet, and the female end should be plugged into the receptacle on the AVR 354's rear panel. See Figure 36.

Figure 36 – AC Power Input

Step Seven – Insert Batteries in Remote

The AVR 354 remote control uses four AAA batteries, which are included.

To remove the battery cover located on the back of the remote, squeeze the tab and lift the cover.

Insert the batteries, as shown in Figure 37, making sure to observe the correct polarity.

Figure 37 – Remote Battery Compartment

When using the remote, remember to point the lens toward the front panel of the AVR 354. Make sure no objects, such as furniture, are blocking the remote's path to the receiver. Bright lights, fluorescent lights and plasma video displays may interfere with the remote's functioning. The remote has a range of about 20 feet, depending on the lighting conditions. It may be used at an angle of up to 30 degrees to either side of the AVR.

If the remote lights up when a button is pressed but the AVR does not respond, check that the Zone Selector Switch at the bottom is in the Zone 1 position.

If the remote seems to operate intermittently, or if pressing a button on the remote does not cause the AVR Settings Button or one of the Source Selectors to light up, then make sure the batteries have been inserted correctly, or replace all three batteries with fresh ones.

Step Eight – Program Sources Into the Remote

The AVR 354 remote not only is capable of controlling the receiver, but it may also be programmed to control many brands and models of DVD players, cable boxes, satellite receivers, the Harman Kardon DMC 1000 digital media center and TVs. It is also preprogrammed to operate your iPod when docked in The Bridge II.

It may help to think of the remote as a book with pages. Each "page" represents the button functions for a different device. To access the functions for a particular device, first turn to its page; that is, switch the remote's device mode. Press the AVR Settings Button to access the codes that control the receiver, or the Source Selector Buttons to access the codes for the devices programmed into the remote.

The AVR 354's remote control is factory-programmed to control many Harman Kardon DVD players. If you have other source devices in your system, follow these steps to program the correct codes into the remote.

1. Using the codes in Tables A14 – A24 of the Appendix, look up the product type (e.g., DVD, cable TV box) and the brand name of your source. The number(s) listed is/are potential candidates for the correct code set for your particular device.

NOTE: The AUX Source Selector is used for the CD, HDTV, PVD recorder, TiVo and VCR device types. Select the brand code from the appendix table corresponding to the device and program it into the AUX Source Selector. Similarly, the CBL/SAT Source Selector is used for either a cable or satellite TV set-top box. The first digit of the product code indicates the device type.

2. Turn on your source device.

3. This step places the remote in program mode. Referring to Figure 38, press and hold the Source Selector. The button will turn red, then go dark. Continue holding it, and when it turns red again, release the button; the remote is now in program mode. Follow the directions in Step 4, below.

Figure 38 – Source Selectors

Optional: To reassign a device type from one Source Selector to another Source Selector not being used (e.g., if there are two DVD players in the system), press the Source Selector for the new device type now. For example, to reassign the Cable/Sat Source Selector to operate a DVD player, first press and hold the Cable/Sat Button, and then press the DVD Button.

4. Enter a code from Step 1, above.

   a) If the device turns off, press the Source Selector again to accept the code; it will flash. The remote will exit Program mode.

   b) If the device does not turn off, try entering another code. If you run out of codes, you may search through all of the codes in the remote's library for that product type by pressing the ▲ or ▼ Button repeatedly until the device turns off. When the device turns off, enter the code by pressing the Source Selector, which will flash. The remote then exits Program mode.

5. Once you have programmed a code, it's a good idea to try using some other functions to control the device. Sometimes, manufacturers use the same Power code for several different models, while other codes will vary. You may wish to repeat this process until you've programmed a satisfactory code set that operates most of the functions you frequently use.

6. Find out which code number you have programmed by pressing and holding the Source Selector to enter the Program mode. Then press the OK Button, and the Source Selector will flash in the code sequence. One flash represents "1", two flashes for "2", and so forth. A series of many fast flashes represents "0". Record the codes programmed for each device in Table A9 in the appendix.

After you have programmed a code set to operate a device, test the functions to see which ones may be missing or not operating correctly. You may "learn" individual key codes if you have the device's original remote control by following this procedure:

a) Place the two remotes so that their IR transmitters face each other end to end, separated by about one inch. See Figure 39. The AVR 354 remote's transmitter also serves as an IR receiver during the learning process.

Figure 39 – AVR 354 and Original Remote Head-to-Head

b) Press the Source Selector for the device mode you wish to learn a code into, and place the AVR 354 remote in Learning mode by pressing and holding the Learn Button until the Source Selector lights up, then release. See Figure 40.

Figure 40 – Learning Remote Commands

c) Press the button on the AVR 350 remote you wish to program with the new code, and the Source Selector will flash once. You may learn a new code into the following buttons: Device Power On/Off, Alphanumeric Keys, Last Button, Back/Exit Button, Menu Button, ▲/▼/◀/▶ Navigation Buttons, OK Button, Disc Menu Button, the four Teletext Buttons, Channel Up/Down, Volume Up/Down, Mute and the Transport Controls (including Record).

d) Press and hold the button on the device's original remote whose code you wish to "learn" until the Source Selector flashes three times, then release.

e) You may program additional buttons by repeating steps c) and d). Press the Learn Button once to exit Learning mode, or wait for the remote to "time out" and exit Learning mode on its own after about 30 seconds.

If you are unable to locate a code set that correctly operates your source device, it will not be possible to use the AVR remote to control that device. However, you may still connect the source to the AVR 354 and operate it using the device's original remote control.

Most of the button labels on the remote describe the button's function when used to control the AVR 354. However, the button may perform a very different function when used to control another device. Refer to the Remote Control Function List, Table A13 in the Appendix, for a list of each button's functions with the various product types.

If you wish, you may program Activities, which are preprogrammed code sequences that execute many code commands with a single button press. You may also program "punch-through" codes, which allow the remote to operate the channel or transport controls of another device without having to switch the remote's device mode. See page 56 for instructions on these advanced programming functions.

Step Nine – Remote IR Inputs and Output (Optional)

The AVR 354 is equipped with a Remote IR Input, a Zone 2 Input and both full-carrier and stripped Remote IR Outputs to facilitate use of your system with a remote control in a variety of situations. See Figure 41.

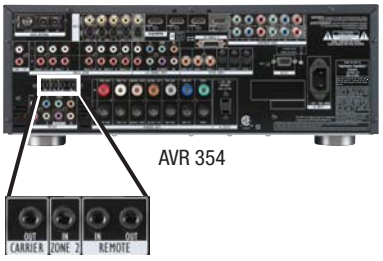


Figure 41 – IR Inputs and Outputs

When the AVR 354 is placed in such a way that aiming the remote at the front-panel IR sensor is difficult, such as inside a cabinet or facing away from the listener, you may connect an external IR receiver, such as the optional Harman Kardon HE 1000, to the Remote IR Input jack. When you are using the AVR 354 in multizone mode, you may connect an optional IR receiver, keypad or other control device to the Zone 2 IR Input for remote control of the AVR 354 (and any sources connected to the AVR's Remote IR Output) from the remote zone. Any signals transmitted through the Zone 2 IR Input will only control source selection and volume for the remote zone. If a source device is being shared with the main listening area, then any control commands issued to that source will also affect the main room.

If any of your source devices are equipped with a compatible Remote IR Input, use a 1/8" mini-plug interconnect cable (not included) to connect the AVR's Remote IR Output to the source device's Remote IR Input, which will pass any applicable remote signals transmitted through the AVR to the source device. This enables you to control your sources even when the AVR itself is controlled via an external IR receiver.

Check with the manufacturer of the source device for more information on the type of IR signal expected. The AVR 354 will output a "stripped carrier" IR signal through the Remote IR Output, but a full-carrier IR signal is available at the Carrier Remote IR Output.

To control more than one source device using the Remote IR Output, connect all sources in "daisy chain" fashion, with the AVR's Remote IR Output connected to the first device's Remote IR Input, the second device's Remote IR Output connected to the next device's Remote IR Input, and so forth. Connect devices expecting a full-carrier IR signal to the Carrier Remote IR Output. Use the Remote IR Output for devices expecting a stripped signal.

Step Ten – Install a Multizone System (Optional)

The AVR 354 offers several methods of distributing music to other listening areas in your home. A multizone system is not required to enjoy the home theater experience. If you prefer not to install a multizone system at this time, skip to Step Eleven to turn on the AVR 354 and configure it.

IMPORTANT SAFETY NOTE: Installing a multizone system typically requires running various cables inside walls. Always comply with the appropriate safety codes when installing concealed wiring. The AVR 354's multizone connections should be installed per the requirements of all applicable state and local building codes, as well as NEC (National Electrical Code) requirements. Failure to do so may present a potential safety hazard. If you have any doubt about your ability to work with electrical and telecommunications wiring, you are advised to hire a licensed electrician or custom installer to install the multizone system.

Multizone operation uses the Surround Back/Zone 2 amplifier channels, whether you connect the remote speakers directly to the speaker outputs, or if you connect an optional external amplifier to the preamp outputs. This limits the system in the main listening room to 5.1 channels, which means you cannot listen to 6.1- or 7.1-channel programs in the main room.

Select one or all three of these systems:

1. Connect an external amplifier to the Zone 2 Audio Outputs. See Figure 42.

Figure 42 – Zone 2 Audio Outputs

It is recommended that you place the amplifier in the same room as the AVR 354 so that a shorter length of interconnect cable is used with a long run of speaker wire to the remote room, rather than placing the amplifier in the remote room, which necessitates a long run of interconnect cable that would be subject to signal degradation. Depending on the number of channels available in your amplifier, you may distribute the AVR 354's analog audio signal to a single pair of speakers for 2-channel listening, or to several pairs of speakers located in different rooms.

The advantage of using the Zone 2 Audio Outputs is the ability to have a 7.1-channel system in the main listening area at the same time others are listening to a different source in the remote zone. However, the benefit is achieved at the expense of purchasing an additional component, i.e., the amplifier.

2. Connect the remote room's speakers directly to the Surround Back/Zone 2 Speaker Outputs. See Figure 43.

Figure 43 – Surround Back/Zone 2 Speaker Outputs

If you prefer not to purchase an external amplifier, you may reassign the AVR 354's Surround Back amplifier channels to power the speakers. However, your main system will be limited to 5.1 channels, which affects playback of discs and other programs recorded in 6.1 or 7.1 channels.

3. Connect an external amplifier to the Surround Back/Zone 2 Preamp Outputs. See Figure 44.

Figure 44 – Surround Back/Zone 2 Preamp Outputs

This method also requires you to provide an additional amplifier. However, this method may be used to increase the number of remote rooms in the system when you are also using the Surround Back/Zone 2 Speaker Outputs and the Zone 2 Audio Outputs.

In addition to the audio signal, you may connect an IR control device to the AVR 354's Zone IR Input so that listeners in the remote room may turn the multizone system on or off, select a source input, control the source device connected to that input and adjust the volume in the remote zone.

NOTE: Only analog audio sources are available to the multizone system.

Step Eleven – Turn On the AVR 354

Two steps are required the first time you turn on the AVR 354.

1. Gently press the Master Power Switch until the word OFF is no longer visible. The Power Indicator above the two power switches should light up in amber, indicating that the AVR is in Standby mode and is ready to be turned on. See Figure 45. Normally, you may leave the Master Power Switch in the ON position, even when the receiver is not being used.

Figure 45 – Power Switches

2. There are several ways in which the AVR 354 may be turned on from Standby mode.

a) Press the Standby/On Switch on the front panel. See Figure 45.

b) Using the remote, press the AVR Power On Button or any of the Source Selectors. See Figure 46.

Figure 46 – AVR Power On and Source Selectors

NOTES:

- Any time you press one of the Source Selectors on the remote (i.e., Cable/Sat, DVD, Media Server, Radio, TV, Game or AUX), the remote will switch modes to transmit the codes programmed to operate that device. To control the receiver, press the AVR Settings Button to return the remote to AVR mode. Some AVR functions are available in all device modes, and you don't have to press the AVR Settings Button first to use them: Volume Controls (including Mute), Audio Effects, Video Modes, Surround Modes, AVR Settings, Info Settings, Sleep Settings and AVR Power On and Off.

- If you are not using the AVR's HDMI Output with your display, you may not see a picture the first time you turn on the AVR 354, or after a system reset. To correct this, press the front-panel Resolution Button to display the current video output resolution. Use the ▲ Button to change it to 480i, which should be compatible with all video displays, then press the OK Button to select the new setting. You will be prompted to accept or cancel the change; the CANCEL message will appear on the front panel. Press the ▼ Button to view the ACCEPT option, and then press the OK Button to complete the change to the output resolution. Follow the directions in the Initial Setup section to configure the AVR to function correctly with your display and other components.

Before you begin enjoying your new receiver, a few adjustments should be made to configure the AVR 354 to match your actual system.

Make sure that you have connected a video display to one of the video monitor outputs on the receiver. When you turn on your display and the AVR, if the display is connected to the AVR via an analog video (composite, S-video or component) connection, you may see a plain black screen. If that happens, press the front-panel Resolution Button, and the current video output resolution will appear in the Message Display. Use the ▲ Button to change it to 480i, which should be compatible with all video displays, then press the OK Button to select the new setting. You will be prompted to accept or cancel the change; the CANCEL message will appear on the front panel. Press the ▼ Button to view the ACCEPT option, and then press the OK Button to complete the change to the output resolution. The Main Menu should appear when you press the AVR Settings Button on the remote, or the AVR Button on the front panel. See Figure 47.

Figure 47 – Main Menu

Although it's possible to configure the AVR using only the remote and the front-panel messages, we recommend that you use the full-screen menu system.

NOTE: When using the AVR's on-screen menu system, we recommend selecting a video output resolution of 720p or higher for best legibility, and to provide graphics that simplify some configuration options. Depending on the resolution selected, the menus shown by your system may vary in appearance.

Using the On-Screen Menu System

The menu system is accessed by pressing the AVR Settings Button on the remote. See Figure 48.

Figure 48 – Settings Buttons

The Main Menu will appear (see Figure 47), and if a video source is playing, it will be visible behind the transparent menu.

The menu system consists of five main menus: Source Selection, Setup Source, Speaker Setup, Zone 2 and System.

Use the ▲/▼/◀/▶ Buttons on the remote or front panel to navigate the menu system, and press the OK Button to select a menu or setting line or to enter a new setting.

The current menu, setting line or setting will appear in the Message Display as well as on screen.

To return to the previous menu or exit the menu system, press the Back/Exit Button. Be certain all settings are correct, as any changes you have made will be retained.

We recommend that most users follow the instructions in this INITIAL SETUP section to configure a basic home theater system. You may return to these menus at any time to make additional adjustments. Thanks to the EzSet/EQ system, most of the menu adjustments may be saved until you have become more familiar with the AVR, and are therefore described in the Advanced Functions section.

The Initial Setup section requires that you complete all of the steps in the Installation section that apply to your receiver. You should have connected all of your loudspeakers and a video display, as well as your source devices. You should be able to turn on the receiver and view the main menu on your video display when you press the AVR Settings Button. If necessary, reread the Installation Section and the beginning of this section before continuing.

Configure the AVR 354 Using EzSet/EQ Technology

One of the most important and perhaps often overlooked aspects of setting up a home theater system is to calibrate the receiver to match the loudspeakers, which enables the AVR to perform at its best.

Until recently, most receivers required the user to perform the calibration and configuration manually, a somewhat tedious process that called for a good ear or the purchase of an SPL (sound-pressure level) meter. Although you may configure the AVR 354 manually, as described in the Advanced Features section, we recommend that you take advantage of our signature EzSet/EQ system.

Before beginning, eliminate extraneous background noise that might affect the results, such as noisy air conditioning. Try to avoid making any loud noises while running EzSet/EQ setup.

IMPORTANT SAFETY NOTE: During the EzSet/EQ procedure, a series of very loud test tones will be played through all of the speakers. Avoid sitting or standing close to any one speaker during the procedure. If you are particularly sensitive to loud noises, you may wish to leave the room and have someone else run the EzSet/EQ process.

Step One – Place the included EzSet/EQ microphone in the listening position, or in the center of the room, at about the same height as the listeners' ears. The microphone features a threaded insert on the bottom so that it can be mounted on a camera tripod for stability.

Step Two – Plug the EzSet/EQ microphone into the Headphone Jack/EzSet/EQ Microphone Input Jack on the front of the receiver. See Figure 49.

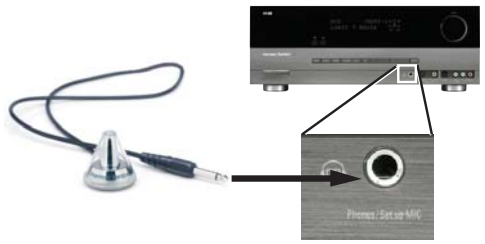


Figure 49 – Plug EzSet/EQ microphone into receiver.

Step Three – Make sure that the AVR 354 and the video display are turned on. Press the AVR Settings Button to display the Main Menu. See Figure 47. Use the ▼ Button to highlight the Speaker Setup line, and then press the OK Button. See Figure 50.

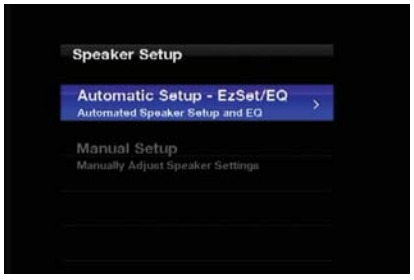


Figure 50 – Speaker Setup Menu Screen

Select "Automatic Setup-EzSet/EQ" and the screen shown in Figure 51 will appear to direct you to plug the EzSet/EQ microphone into the Headphone Jack, and to set the level control on the subwoofer to the halfway point.

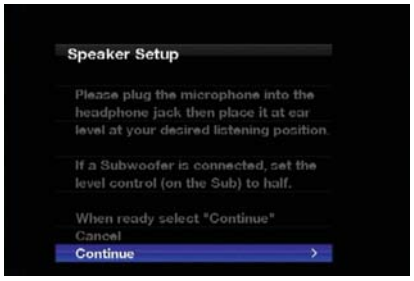

Speaker Setup
Please plug the microphone into the headphone jack then place it at ear level at your desired listening position.
If a Subwoofer is connected, set the level control (on the Sub) to half.
When ready select "Continue"
Cancel
Continue

Figure 51 – EzSet/EQ Screen

At any time, you may select Cancel to return to the Speaker Setup menu without starting the EzSet/EQ process. When you are ready to begin, select Continue and press the OK Button.

NOTE: Before running the EzSet/EQ process, the AVR 354 will automatically set its master volume to –25dB.

Step Four – After you select "Continue", the screen shown in Figure 52 will appear, directing you to select the number of speakers in your system. Select 5.1 if no surround back speakers are present, or if the surround back channels will be used for multizone operation.

Figure 52 – EzSet/EQ: Number of Speakers

NOTE: If you are using fewer than five main speakers in your system, it will not be possible to configure your speakers using the EzSet/EQ process; proceed as described in the Advanced Functions section. If you have selected a 6.1-channel configuration, using only a single surround back speaker, it is possible to use a combination of EzSet/EQ automatic configuration for 5.1 speakers, connect the single surround back speaker to the *left* Surround Back Speaker Output, and then configure the surround back speaker manually, as described in the Advanced Functions section. However, we do not recommend the 6.1-channel configuration.

The test will begin, and the screen shown in Figure 53 will appear, asking you to maintain silence during the EzSet/EQ configuration. If possible, turn off any noisy appliances, such as air conditioners. Avoid conversation. If unwanted sounds are inadvertently heard during the test, such as a telephone, select Cancel to return to the Speaker Setup menu.

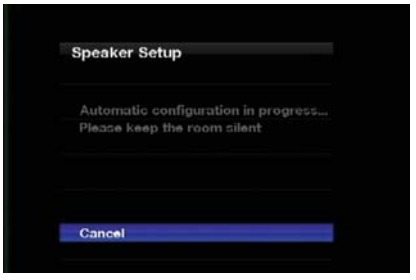


Figure 53 – EzSet/EQ in Progress

As EzSet/EQ tests each speaker, its position will appear on screen. Select Cancel to stop the test. If the test tone is heard from a different speaker than the one indicated on screen, turn off the AVR and check the speaker-wire connections, then turn the AVR back on and begin the procedure again.

When the test is completed, the Continue option, will become available. Select it, and a screen will appear, listing all of the speakers the EzSet/EQ process detected, and offering three options:

- The Retest option reruns the EzSet/EQ process. Increasing the master volume manually at this time may enable the EzSet/EQ process to correctly detect some speakers.
- Selecting Cancel returns to the Speaker Setup menu.
- If the EzSet/EQ process detected the speakers correctly, select Continue to proceed to the next test.

Step Five – During the next portion of the test, the EzSet/EQ procedure equalizes the AVR 354's audio circuitry to compensate for the specific room characteristics and the performance capabilities of each individual speaker. To do this successfully, the EzSet/EQ microphone must be placed about two feet from each speaker in the direction toward the listening position. Wait until the on-screen instructions prompt you before moving the microphone.

When the EzSet/EQ process has finished, a screen will appear with its results.

See the Advanced Functions section for instructions on how to manually configure the speakers or manually adjust the settings established by the EzSet/EQ process.

Set Up Sources

The Source Info menu is used to assign the correct physical audio and video connections to each source. It also provides access to a variety of other settings, many of which may be adjusted later as you become more familiar with the AVR.

The following settings are not optional and must be adjusted now to enable playback of each source: Video Input from source, Audio Input from Source and Resolution to Display.

The other settings may be adjusted at any time to improve performance.

To display the Source Info menu, press the Info Settings Button (front panel or remote). A screen similar to the one shown in Figure 54 will appear. This screen may also be accessed from the Main Menu by selecting the Setup Source line and selecting a source from the slide-in menu.

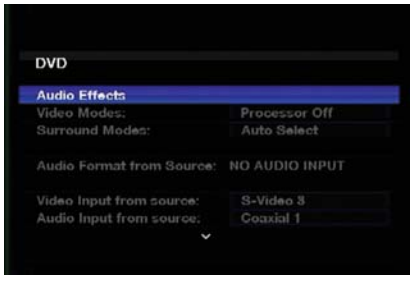


Figure 54 – Setup Source Menu

Audio Effects: Select this line to display the Audio Effects submenu, where you may: adjust the bass and treble tone controls; adjust the LFE trim; or adjust the Night Mode setting. It is recommended that you leave this submenu at its default settings, and return to it later if your system requires any fine-tuning. See the Advanced Functions section for more information.

Video Modes: Select this line to display the Video Modes submenu, to select from preprogrammed or custom picture settings and make picture adjustments. It is recommended that you leave the settings at their factory defaults. Picture adjustments should be made to your video display first, with this menu used only for fine-tuning. See the Advanced Functions section for more information.

Surround Modes: Select this line to display the Surround Modes submenu, where you may program the desired surround mode for various types of analog programs, including movies, music and games. You may also specify a stereo mode (depending on the number of channels desired) and a virtual surround mode if your system uses fewer than the full complement of seven main speakers (plus a subwoofer).

Digital surround signals, such as Dolby Digital and DTS, are automatically played in their native formats, although you may change the surround mode at any time. See the Advanced Functions section for information on surround modes available with digital programs.

In the factory default Auto Select mode, the AVR will analyze the source signal and select the optimum playback mode. The AVR's default is to use the Logic 7 Movie mode for optimal playback of movies, including television programs; the Logic 7 Music mode for music recordings, such as CDs; and the Logic 7 Game mode when a video game console is in use. Select a surround mode corresponding to your selection, i.e. a movie, music or a video game. To reprogram any of the lines in the Surround Modes menu, select it and choose from the list of available surround modes. Whenever you manually select the mode during playback, the AVR will use the new surround mode.

Selecting a surround mode is a matter of taste, although the available modes depend on the number of speakers in your system and the format of the incoming signal. Feel free to experiment by selecting any available mode at any time until you find a few modes that you prefer. See the Advanced Functions section for more information.

Audio Format From Source: This line is informational only. When a digital program is playing, its format will be identified here. When analog audio programs are playing, this line indicates NO AUDIO INPUT, referring to digital inputs only.

Audio and Video Input Selection

Please see Table A2 in the appendix for the factory default input assignments for each source. You may assign any available input to any source using the Source Info menu, accessible either by pressing the AVR Settings Button and selecting the Setup Source line, or by pressing the Info Settings Button for direct access.

When a source is selected, the AVR will check the assigned digital audio input for a signal. If one is present, the digital input will be selected. If not, the AVR will select the analog audio input specified at the Audio Auto Polling line of the Setup Source menu. If you don't want the AVR to select an analog audio input for the source, change this setting to Off.

The AVR will also select the assigned video source. There are no "audio-only" sources on the AVR 354, other than the Radio, which uses a special on-screen menu. If no video signal is present, the display will remain black. You may pair an audio device with an A/V device's video signal using the Source Info menu. Sources may share audio or video inputs to suit your application.

NOTE: The Bridge II obtains its audio and video signals (when available) from the iPod docked in it, and it may not be used with other audio or video sources.

Video Input From Source: Select this line to assign the correct video input to the source. Refer to Table A5 in the appendix, where you noted the physical video input the source is connected to, and select the input here.

Audio Input From Source: Select this line to assign the correct analog or digital audio input to the source. Refer to Table A5 in the appendix, where you noted the physical audio input the source is connected to, and select the input here. If both analog and digital audio connections were made, select the digital input here, and select the analog input at the Audio Auto Polling line below.

6-/8-Channel Direct Inputs

The 6-/8-Channel Analog Audio Inputs are used when playing certain multichannel discs, such as DVD-Audio, Blu-ray Disc, SACD and HD-DVD, on a player that decodes the audio and outputs it via its multichannel analog audio outputs but not via its HDMI output.

HDMI-Equipped Multichannel Disc Player:

- Connect the player's HDMI output to one of the AVR's HDMI Inputs. No other connections are necessary.
- Assign the HDMI Input to both the Audio and Video Input from source settings in the Source Info menu.

HDMI-Equipped Multichannel Disc Player That Does Not Output Multichannel Audio via an HDMI Connection:

- Connect the player's HDMI output and its multichannel analog audio outputs to one of the AVR's HDMI Inputs and to the AVR's 6-/8-Channel Analog Audio Inputs.
- Assign the HDMI Input to both the Audio and Video Input from source settings in the Source Info menu.
- Assign the 6-/8-Channel Analog Audio Inputs to the Audio Auto Polling setting in the Source Info menu.
- When listening to DVD-Video discs, CDs or other materials outputting standard-definition digital audio, do nothing, as long as the HDMI Input is assigned to the Audio Input from source setting.
- When listening to high-resolution multichannel discs, the AVR's auto polling feature will automatically switch to the multichannel analog audio inputs.

Multichannel Disc Player Without HDMI Output, or When Video Display Has No HDMI Input:

- Connect the player's component video outputs to one set of Component Video Inputs on the AVR. Depending on the capabilities of the player and your video display, you may need to use a composite or S-video connection instead.
- Connect the player's digital audio output to a corresponding available digital audio input on the AVR.
- Connect the player's multichannel audio outputs to the AVR's 6-/8-Channel Analog Audio Inputs.
- Assign the correct audio and video inputs to the Audio and Video Input from source Settings in the Source Info menu.
- Assign the 6-/8-Channel Analog Audio Inputs to the Audio Auto Polling setting in the Source Info menu.
- When listening to DVD-Video discs, CDs or other materials outputting standard-definition digital audio, do nothing, as long as the correct digital audio input is assigned to the Audio Input From Source setting.
- When listening to high-resolution multichannel discs, the AVR's auto polling feature will automatically switch to the multichannel analog audio inputs.

> **NOTE:** The 6-/8-Channel Inputs pass the incoming signals directly to the volume control, without digitizing or processing them. Configure the bass management settings (i.e., speaker size, delay and output level) on your source device to match the settings programmed using the EzSet/EQ procedure, which may be viewed using the Speaker Setup menu (see Advanced Functions section). Consult the owner's guide for your multi-channel player for more information.

Resolution to Display: This setting, which may also be accessed from the AVR Settings menu, reflects the video output resolution, which is dependent upon the capabilities of the video display.

- If the display is connected to the AVR's HDMI Output, the HDMI protocol enables the two devices to communicate with each other, and the AVR will automatically select the correct video output resolution.
- If the display is connected to the AVR's Component Video Outputs, there is no automatic detection of the display's capabilities, and the video output resolution must be manually adjusted to match the display's capabilities (which may be obtained from the display's manual or its manufacturer's Web site).
- If the display is connected to the AVR's Composite or S-Video Monitor Output, the video output resolution must be manually set to 480i to view any content, including the AVR's own menus.

Since there is no picture if the resolution is set higher than the display's capability, adjust the resolution by pressing the front-panel Resolution Button repeatedly until the correct setting appears in the front-panel Message Display. For composite and S-video, the correct setting is 480i. For component video, it is the highest resolution where a picture is visible. You will be prompted to accept or cancel the resolution change, as the CANCEL message will appear on the front panel. Press the ▼ Button to view the ACCEPT option, and then press the OK Button to complete the change to the output resolution.

> **NOTE:** When the display has a DVI input which is connected to the AVR using an HDMI-to-DVI adapter, the picture will be distorted or blank if the display is not HDCP-compliant. In that case, a different video connection must be used (component, composite or S-video).

Resolution From Source: This line, which is informational only, indicates the video format (NTSC or PAL) output by the source device. NTSC is the video format used for standard-definition television in the U.S. and other parts of the world. The PAL format is used in parts of Europe and elsewhere. The AVR 354 is capable of detecting PAL video sources and converting them to the NTSC format for display on American televisions.

Adjust Lip Sync: Use this adjustment to resynchronize the audio and video signals from a source to eliminate a "lip sync" problem. Lip sync issues can occur when the video portion of a signal undergoes additional processing in either the source or the video display that desynchronizes it from the audio. Select this line to display the Lip Sync adjuster by itself, enabling you to view the video while listening to the audio. Use the ◀/▶ Buttons to delay the audio by up to 180ms. See Figure 55.

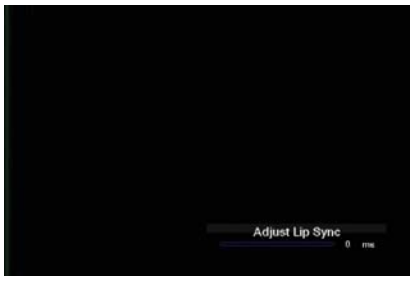


Figure 55 – Adjust Lip Sync

Change Name: Use this line to change the display name for your source. This can be useful if your source's device type is different from the available source names. Select this line and use the ▲/▼ Buttons to scroll forward or reverse through the letters A through Z and the numbers 0 through 9. When the desired character appears, use the ▶ Button to move the cursor to the next position. Move the cursor again to leave a blank space. When you have finished entering the new name, press the OK Button. The name will be used on the front panel to refer to the source, and will appear next to its original name, e.g., DVD, throughout the on-screen menu system. To clear the entry without making any changes, scroll to the blank character between "9" and "A".

Audio Auto Polling: Use this setting when both analog and digital audio connections are made from the source device to the AVR. When no digital signal is present, the AVR will automatically switch to the analog audio input.

This can be useful for some older cable television systems that broadcast some channels in analog audio and others in digital audio. It is also useful for making analog recordings of copy-protected digital sources, and for multichannel disc players that decode high-resolution multichannel audio and output it through their multichannel analog audio outputs. However, it can be inconvenient when no analog audio connection is made and playback is stopped, as the audio signal will be lost.

If an analog audio connection was made, select it here. If not, choose the Off setting, and the AVR will always use the digital audio connection.

Zone 2 Audio: When a multizone system has been connected and is in use, this setting determines the source for the remote zone. Select the analog audio input the source is connected to. Digital audio is not available to the multizone system, nor is any type of video.

Use the Back/Exit Button to exit, then return to the Setup Source line of the Main Menu and select the next source to configure. When you have finished configuring all sources, press the Back/Exit Button to clear the menus from view.

You are now ready to begin enjoying your new receiver!

OPERATION

Now that you have installed your system components and completed a basic configuration of your receiver, you are ready to begin enjoying your home theater system.

Turning On the AVR 354

Gently press the Master Power Switch until the word OFF is no longer visible. The Power Indicator above the two power switches should light up in amber. This indicates that the AVR is in Standby mode and is ready to be turned on. Normally, you may leave the Master Power Switch in the ON position, even when the receiver is not being used. See Figure 45.

There are several ways in which the AVR 354 may be turned on:

a) Press the Standby/On Switch on the front panel. See Figure 45.

b) Using the remote, press the AVR Power On Button or any of the Source Selectors. See Figure 46.

To turn the receiver off, press either the Standby/On Switch on the front panel, or press the AVR Power Off Button on the remote. Unless the receiver will not be used for an extended period of time (for example, when are on vacation), it is not necessary to turn off the Master Power Switch. When the Master Power Switch is turned off, any settings you have programmed, including system configuration and preset radio stations, will be preserved for up to four weeks.

IMPORTANT NOTE: If the PROTECT message ever appears in the Message Display, turn off the AVR and unplug it. Check all speaker wires for a possible short. If none is found, bring the unit to an authorized Harman Kardon service center for inspection and repair before using it again.

Volume Control

The volume may be adjusted either by turning the knob on the front panel (clockwise to increase volume or counterclockwise to decrease volume), or by pressing the Volume Control on the remote. See Figure 56. The volume is displayed as a negative number of decibels (dB) below the 0dB reference point.

Unlike the volume controls on some other products, 0dB is the maximum volume for the AVR 354. Although it's physically possible to turn the volume to a higher level, doing so may damage your hearing and your speakers. For certain more dynamic audio materials, even 0dB may be too high, allowing for damage to equipment. We urge caution with regard to volume levels.

You may change the volume level display from the default decibel scale to a 0-to-100 scale by adjusting the Volume Units setting in the System Settings menu, as described on page 55.

Figure 56 – Volume Controls

Mute Function

To temporarily mute all speakers and the headphones, press the Mute Button on the remote. See Figure 56. Any recording in progress will not be affected. The MUTE message will appear in the display as a reminder. To restore normal audio, either press the Mute Button again, or adjust the volume. Turning off the AVR will also end muting.

Sleep Timer

You may program the AVR to play for up to 90 minutes and then turn off automatically using the sleep timer.

Press the Sleep Settings Button on the remote, and the time until turn-off will be displayed. See Figure 57. Each additional press of the Sleep Button will increase the time until turn-off by 10 minutes, up to a maximum of 90 minutes, then the SLEEP OFF setting appears, which disables the sleep timer.

Figure 57 – Sleep Settings Button

When the sleep timer has been set, the front-panel display will automatically dim to half-brightness. If you press any button on the remote or front panel, the display will return to full-brightness. The display will dim again several seconds after your last command.

If you press the Sleep Button after the timer has been set, the remaining time until turn-off will be displayed. You may press the Sleep Button to change the time until turn-off.

Audio Effects

Depending on your preferences or the specific characteristics of your listening room, you may wish to adjust some of the audio settings, such as tone controls, to improve performance. Access these settings from the Audio Effects submenu, as described in the Advanced Functions section.

It is not necessary to adjust the Audio Effects settings to enjoy your new AVR. We recommend leaving the settings at their default values until you are more familiar with your system.

Video Modes

The settings in the Video Modes menu are used to fine-tune the picture if necessary after making all adjustments on the video display. It is recommended that you leave the settings at their defaults. See the Advanced Functions section for detailed information.

Headphones

Plug the 1/4" plug on a pair of headphones into the headphone jack on the front of the receiver for private listening. See Figure 58.

The DOLBY H:BYPASS message indicates that Dolby Headphone surround processing is in the default bypass mode, which delivers a conventional 2-channel signal to the headphones.

Figure 58 – Headphone Jack

Press the Surround Modes Button on the front panel or the remote, to switch to Dolby Headphone virtual surround processing, indicated by the DOLBY H:DH message. Dolby Headphone delivers an enhanced sound field that emulates a 5.1-channel speaker system. No other surround modes are available for the headphones.

Source Selection

Press the front-panel Source List Button to scroll through the sources. Each press of the button scrolls down the list that appears in the display and on screen. See Figure 59.

Figure 59 – Source List Button

For direct access to any source, press its Source Selector on the remote.

The AVR 354 will switch to the audio and video inputs assigned to the source.

The source name will appear in the upper line of the front-panel display. If you retitled the source, the new title will appear. The audio and video inputs assigned to the source will also appear briefly. The surround mode will be displayed on the lower line.

Any other settings you adjusted in the Setup Source menu will also be selected. You may view these settings in the Source Info menu at any time by pressing the Info Settings Button.

VIDEO TROUBLESHOOTING TIPS:
If a video source is playing and there is no picture:

- Check that you have selected the source to which the video input was assigned.
- Check the wires for a loose or incorrect connection.
- Check that you have selected the correct video input on the display device (TV).
- Try pressing the Resolution Button on the front panel repeatedly until the correct video output resolution is selected and a picture appears. You will be prompted to accept or cancel the resolution change, as the CANCEL message will appear on the front panel. Press the ▼ Button to view the ACCEPT option, and then press the OK Button to complete the change to the output resolution.

Additional Tips for Systems Using HDMI:

- Turn off all devices (including the TV, AVR and any source components).
- Unplug the HDMI cables starting with the cable between the TV and AVR, and continuing with the cables between the AVR and each source device.
- Carefully reconnect the cables from the source devices to the AVR, and connect the cable from the AVR to the TV last.
- Turn on the devices in this order: TV, then AVR, then source devices.

Using the Tuner

To select the AVR 354's built-in tuner:

1. Press the Source List Button on the front panel repeatedly until the desired tuner band is selected, or use the ▲/▼ Buttons to scroll through the source list.
2. Press the Radio Source Selector on the remote. Press this button again to switch bands (AM, FM or XM).

A screen similar to the one shown in Figure 60 will appear, with the band indicated in the middle of the screen. (The XM band uses a slightly different screen.)

Figure 60 – FM Radio

Use the ▲/▼ Buttons to tune a station (or channel for XM Radio). The frequencies will be displayed in the front panel and graphically on screen.

The AVR defaults to automatic tuning, meaning each press of the ▲/▼ Buttons scans through all frequencies until a station with acceptable signal strength is found. To switch to manual tuning, in which each press of the ▲/▼ Buttons steps through a single frequency increment (0.1MHz for FM, or 10kHz for AM), press the Menu Button. The Radio Modes line will be highlighted, and each press of the OK Button toggles between automatic and manual tuning modes.

When an FM station has been tuned, toggling the radio mode switches between stereo and monaural play, which may improve reception of weaker stations.

A total of 30 stations (AM and FM together) may be stored as presets. When the desired station has been tuned, press the OK Button, and two dashes will flash in the front-panel display. Use the Alphanumeric Keys to enter the desired preset number.

To tune a preset station, press the ◀/▶ Buttons or the Channel Control, or press the Menu Button to view the list of programmed presets and scroll to the desired selection. Press the OK Button to tune the station. You may also enter the preset number using the Numeric Keys. For presets 10 through 30 press 0 before the preset number. For example, to enter preset 21, press 0-2-1.

XM Radio Operation

XM Radio is a satellite-delivered service that offers hundreds of program channels, as well as local traffic and weather information for select cities. The AVR 354 is an XM Ready device, which means that it is able to receive the XM service when a user-supplied XM antenna module is connected and the service activated.

Select an antenna module designated for XM Ready audio components. An XM Ready-compatible module uses the special connector on the AVR 354's rear panel that allows you to use the AVR's tuner, including its 40 preset station locations and remote control. Although you may use a module with standard audio connections, which may be indicated for "car and home use," you will not be able to enjoy the AVR 354's ease of control.

The XM Mini-Tuner and Home Dock (Models CNP-2000 and CNP-2000H; both pieces are required) are compatible with the AVR 354. The older Audiovox® CNP 1000 "Connect and Play" module for home audio use is also compatible, but has been discontinued and may no longer be available. Additional modules may become available in the future. Modules produced for automotive, or "mobile," use are not compatible with the AVR 354, although if they have standard analog or digital audio outputs, they may be connected to a compatible input and operated using their own controls.

NOTE: To listen to XM Radio using the AVR 354, you will need to purchase an XM antenna module and subscription, and activate your module. XM service is not available in Alaska or Hawaii. Visit the XM Radio Web site at www.xmradio.com for more information.

Plug the module into the XM Antenna Jack on the rear of the AVR 354. Place the antenna module so that it has a clear view through a south-facing window in order to obtain reception from the XM satellite.

Select XM Radio as the source in one of these ways:

1. Press the Source List Button on the front panel repeatedly until XM Radio is selected, or use the ▲/▼ Buttons to scroll through the source list.
2. Press the Radio Source Selector on the remote repeatedly until XM Radio is selected..

You should be able to tune in Channel 1, the Preview Channel, to confirm that your equipment is ready for activation. There are four ways to tune an XM Radio channel:

1. Press the Menu Button to select a search mode: preset, category, all channels (the default) or direct entry.
2. Use the ▲/▼ Buttons to scan through the channel numbers in the default All Channel search mode. If you press the OK Button first, pressing the ▲/▼ Buttons will scan through any preset positions you have programmed (Preset search mode).
3. In Category search mode, use the ◀/▶ Buttons to jump to the next category, and then use the ▲/▼ Buttons to scan through the channel numbers within the category.
4. After you have programmed presets, directly enter the preset number (1 through 40) using the Alphanumeric Keys. For single-digit positions, enter a "0" before the number. Select Direct Entry search mode, and use the Alphanumeric Keys to select a channel directly.

When you are able to hear Channel 1, you are ready to activate your module. If you don't hear Channel 1, make sure the module's plug is firmly seated in the XM Antenna jack, and that the module is near a south-facing window. Try unfolding the module and rotating it to obtain reception. You may need to purchase an extension cable, available on the XM Radio site, to ensure that the module is near the window.

Tune to Channel 0 for a display of your antenna module's Radio ID number, required for activation.

The current channel number and preset location will appear in the upper line of the Message Display, and the search mode (all channels, category) will appear in the lower line. Three signal-strength bars will appear to the right of the channel number and preset location to indicate signal strength. The song title, artist and channel category, along with the channel number and preset position (if programmed), will all appear on screen when a video display is in use.

For traffic and weather channels, the current city's name will appear instead of the channel name, and the local weather and temperature will be displayed on screen.

To store a channel in one of the 40 preset locations:

1. Tune to the desired channel and press the OK Button. The lowest available preset number will flash on screen and in the front-panel Message Display.
2. Use the Alphanumeric Keys to enter the numbered preset location you wish to store the channel in, or do nothing if the current preset location is acceptable.
3. Press the OK Button to store the new preset.

Recording

Two-channel analog and digital audio signals, as well as composite and S-video signals, are normally available at the appropriate recording outputs. Thus, to make a recording, you need only make sure to connect your audio or video recorder to the appropriate output jacks, as described in the Installation section, insert blank media and make sure the recorder is turned on and recording while the source is playing.

NOTES:

1. Analog audio signals are not converted to digital form, and digital audio signals are not converted to analog audio form. However, you may record a coaxial or optical digital audio source using either type of digital audio output.
2. Only PCM digital audio signals are available for recording. Proprietary formats such as Dolby Digital and DTS may not be recorded using the digital audio connections, although if the source is connected to the AVR using analog audio connections, an analog recording may be made.
3. HDMI and component video sources are not available for recording.
4. Please make certain that you are aware of any copyright restrictions on any material you record. Unauthorized duplication of copyrighted materials is prohibited by federal law.

Using The Bridge II Docking Station

The Bridge II is an included dock that is compatible with most docking iPod models, 4G and later (not included). When The Bridge II is connected to its proprietary input on the AVR 354 and the iPod is docked, you may play the audio, video and still-image materials on your iPod through your high-quality audio/video system, operate the iPod using the AVR remote or the AVR's front-panel controls, view navigation messages on the AVR's front panel or a connected video display, and charge the iPod.

Either press the front-panel Source Selector repeatedly until the message "The Bridge is CONNECTED" appears in the front panel, or press The Bridge Source Selector on the remote. If the AVR has difficulty detecting that the iPod is connected and you have determined that The Bridge II is properly plugged into the AVR, turn off the AVR, remove the iPod from The Bridge II and reset the iPod as described in its user guide. When the iPod returns to its main menu, redock it and turn on the AVR.

When The Bridge II is connected, the screen shown in Figure 61 will appear on a video display connected to the AVR.

Figure 61 – The Bridge

Press the Menu Button to view the slide-out menu:

Back: This option appears while navigating the contents of the iPod only. Select it to return to the previous screen.

Music: Select this line to navigate the audio materials stored on the iPod.

Photos: Select this line to view still images stored on a photo-capable iPod. The system will switch to iPod Manual Mode, and control will shift to the iPod. Use the screen and controls on the iPod, although the AVR remote may be used for scrolling and selecting.

If the iPod supports video browsing, visual materials may be displayed on a video monitor connected to the AVR as follows: Select the desired photo and press the Play Button *on the iPod itself* to begin slideshow playback. If you use the AVR's remote, press the OK Button *three* times.

Videos: This line may appear, but cannot be selected. If the iPod supports video browsing, you may view videos on an external monitor by following this procedure: Select the Photos line in the on-screen menu so that the system switches to iPod Manual Mode. Use either the controls on the iPod or the AVR remote to select a video for playback, making sure the TV Out setting on the iPod is turned on.

NOTES ON VIDEO PLAYBACK:

- As of this writing, video browsing is only supported on the iPod 5G, iPod classic and iPod nano 3G. For other iPod models, it is not possible to view photos or videos on an external monitor while using The Bridge II. However, you may purchase a compatible A/V cable from Apple Inc. that has a dock connector on one end and conventional audio and video plugs on the other end. The audio/video plugs may be connected to any available analog inputs on the AVR, as you would for any other source device.
- Before attempting to view photos or videos stored on your iPod, check the Video Settings menu on the iPod and make sure that the TV Out setting is set to On. The TV Signal setting should be NTSC to match the capabilities of your video display. Set Widescreen to On or Off, depending on the aspect ratio of your video display. If your selection was playing and paused, the iPod requires you to reselect the video for the new TV Out setting to take effect.
- In iPod Manual Mode, the iPod menus will only be visible on the iPod screen itself. You may operate the iPod using the AVR remote, as long as it is in The Bridge device mode.
- The MP4 and H.264 video formats often used for videos to be played on the iPod are intended for optimal performance on the small screen of the iPod. Playback on larger displays may have different results.

After selecting photo or video viewing, the AVR may remain in iPod Manual Mode, even after undocking the iPod or switching to another source input and back again. To return to normal operation, with the AVR remote in The Bridge mode, press and hold the Menu Button.

Random: Select this setting for random playback, also known as "Shuffle Mode". Each press of the OK Button switches the setting: shuffle by Song, shuffle by Album, or Off to end random playback.

Repeat: Select this setting to repeat a track or all tracks in the current album or play list. Each press of the OK Button switches the setting: repeat Off, repeat One or repeat All.

NOTE: The iTunes application allows you to set certain selections to always be skipped in Shuffle mode. The AVR 354's settings cannot override these iTunes settings.

Table 2 summarizes the controls available when The Bridge II is in use.

Table 2 – Using The Bridge II

iPod Function	Remote Control Key
Play	Play (▶)
Pause	Pause (II)
Menu	Menu
Select	OK
Scroll Reverse	Left Arrow (◀)
Scroll Forward	Right Arrow (▶)
Forward Search/Next Track	Forward/Next (▶▶)
Reverse Search/Previous Track	Reverse/Previous (◀◀)
Page Up/Down	Channel/Page Up/Down

While scrolling, hold the key to scroll faster. Use the Page Up/Down control on the remote to scroll a page at a time.

NOTES:

- The Play and Pause functions are not available unless content has been selected for playback by navigating the menu system.
- To search within a track, press and hold the indicated button. Pressing the Previous Track Button once skips to the beginning of the current track. Press the Previous Track Button *twice* to skip to the beginning of the previous track.

While a selection is playing, the song title, artist and album name, if available on the iPod, will appear in the upper line in the front-panel Message Display. The lower line will display the elapsed time of the track on the left, the play mode icon, and the time remaining on the right.

In addition, if a video monitor is connected to the AVR 354 and the system is not in iPod Manual Mode, it will display information about the status of the iPod and the track, including the play mode icon, the song title, artist and album. A graphic bar indicates the current play position within the track. If random or repeat play has been programmed, an icon will appear in the upper right corner.

After a period of time, the screen may disappear from view. The length of time is set using the Setup and Slide-In Menus setting in the System Settings menu (described in the Advanced Functions section). You may restore the Now Playing screen to view by pressing either of the ◀/▶ Buttons.

NOTE: It is strongly recommended that you use a screen saver built into your video display to avoid possible damage from "burn-in" that may occur with plasma and many CRT displays when a still image, such as a menu screen, remains on display for an extended period of time.

Selecting a Surround Mode

Surround mode selection can be as simple or sophisticated as your individual system and tastes. Feel free to experiment, and you may find a few favorites for certain sources or program types. More detailed information on surround modes may be found in the Advanced Functions section.

To select a surround mode, press the Surround Modes Button (front panel or remote) repeatedly until the desired option appears: SURR: AUTO SELECT, SURR: VIRTUAL, SURR: STEREO, SURR: MOVIE, SURR: MUSIC or SURR: GAME. The option will be displayed in the Lower Line of the Message Display, and the Surround Modes menu will appear on screen (see Figure 62).

Surround Modes [7 Channel]
Auto Select - AVR Selects Best Mode
Virtual Surround: Dolby Virtual Speaker Ref
Stereo: 7 CH Stereo
Movie: Logic 7 Movie
Music: Logic 7 Music
Video Game: Logic 7 Game

Figure 62 – Surround Modes Menu

Auto Select: For digital programs, such as movies recorded with a Dolby Digital soundtrack, the AVR will automatically use the native surround format. For 2-channel analog and PCM programs, the AVR is programmed to default to Logic 7 Movie mode.

Virtual Surround: When only two main speakers are present in the system, Dolby Virtual Surround may be used to create an enhanced soundfield that virtualizes the missing speakers. Select between Wide and Reference modes, depending on your preferences.

Stereo: When 2-channel playback is desired, select the number of speakers used for playback:

- 2 CH STEREO for playback through only two speakers. As described on page 45, you may select Analog Bypass mode for a pure analog signal when analog audio inputs are in use. Simply set the Tone Control setting in the Audio Effects submenu to Off, and the AVR does the rest.
- 5 CH STEREO for playing the left-channel signal through the front and surround left speakers, the right-channel signal through the right speakers and a summed mono signal through the center speaker.
- 7 CH STEREO follows the same scheme as 5 CH STEREO, but adds the surround back speakers to the mix. This mode is only available when the surround back speakers are present and have not been reassigned to multizone operation. See the Initial Setup section for more information.

Movie: Select an analog surround mode for movie playback: Logic 7 Movie, DTS Neo:6 Cinema or Dolby Pro Logic II (IIx when seven main speakers are present). The desired mode may also be selected when a compatible digital surround mode is received.

Music: Select an analog surround mode for music playback: Logic 7 Music, DTS Neo:6 Music or Dolby Pro Logic II (IIx when seven main speakers are present). The Dolby Pro Logic II/IIx Music mode allows access to a submenu with some additional settings. See the Advanced Functions section for more information.

Video Game: Select an analog surround mode for game playback: Logic 7 Game, or Dolby Pro Logic II (IIx when seven main speakers are present).

After you have made your selection, press the Back/Exit Button until the screen is cleared.

See the Advanced Functions section for more information on surround modes.

Much of the AVR 354's performance is handled automatically, with little intervention required on your part. However, the AVR 354 is a sophisticated component, and is capable of being customized to suit your particular system and your tastes. In this section we describe some of the more advanced adjustments available on the AVR 354. You may return to this section later, when you have become more familiar with your receiver.

Audio Processing and Surround Sound

Audio signals output by sources are encoded in a variety of formats that can affect not only the quality of the sound but the number of speaker channels and the surround mode. You may also manually select a different surround mode, although for certain types of audio signals, the modes available will be limited in certain ways, as described below.

Analog Audio Signals

Analog audio signals usually consist of two channels – left and right. The AVR 354 offers three basic options for playback of analog audio:

1. **Analog Bypass Mode:** In this mode, the 2-channel signal is passed directly from the input to the volume control, without being digitized or undergoing any processing for bass management or surround sound. The requirements for selecting analog bypass mode are:

   a) The analog audio inputs for the source must be selected. If necessary, press the Info Button on the remote and use the ▲/▼ Buttons to scroll to the Audio Input from source setting, then select an analog input.

   b) The tone controls must be disabled by setting Tone Control to Off. Press the Audio Effects Button to access the Tone Control setting in the Audio Effects submenu.

   c) The 2-channel Stereo mode must be selected. Press the Surround Modes Button to access the STEREO line of the Surround Modes submenu.

When the Tone Control setting is Off, the front speakers will be set to Large automatically, as indicated by the double boxes in their positions in the Speaker/Channel Input Indicators on the front panel. That indicates that Analog Bypass mode is active. When the Tone Control setting is turned On, if you have set the front speaker crossover to a numeric setting, the front speakers will return to the Small setting, as indicated by single boxes in the Speaker/Channel Input Indicators. When the front speakers are Small and 2-Channel Stereo mode has been selected in the Surround Modes submenu, DSP Surround Off mode is active.

2. **DSP Surround Off Mode:** The DSP Surround Off mode digitizes the incoming signal and applies the bass management settings, including speaker configuration, delay times and output levels. This mode is desirable when your front speakers are small, limited-range satellites and you are using a subwoofer. To select this mode, use a digital audio input, or turn the Tone Control setting off.

3. **Analog Surround Modes:** One of the main benefits of a surround receiver such as the AVR 354 is its ability to process 2-channel audio signals to produce multichannel surround sound in a variety of modes, even when no surround sound has been encoded in the recording. Among the available modes are the Dolby Pro Logic II/IIx modes, the Dolby Virtual Speaker modes, the DTS Neo:6 modes, the Logic 7 modes, and the Stereo modes.

Digital Audio Signals

Digital audio signals offer the benefit of greater capacity, which allows recording artists to encode center and surround channel information directly into the signal. The result is improved sound quality and startling directionality, since each of these channels is reproduced discretely.

Alternatively, the artist may encode only two channels, but the digital signal allows for a higher sampling rate that delivers greater detail. High-resolution recordings usually sound extraordinarily distortion-free at all frequencies, but especially at high frequencies.

Surround Modes

Surround mode selection is dependent upon the format of the incoming audio signal, as well as personal taste. There is no harm in experimenting with all of the modes available with any given source material. Table A12 offers a brief description of each mode the AVR 354 is capable of using, and also indicates the types of incoming signals or digital bitstreams the mode may be used with. Additional information about the Dolby and DTS modes is available on the companies' Web sites: www.dolby.com and www.dtsonline.com.

When in doubt, check the jacket of your DVD for more information on which surround modes are available on the disc. Usually, nonessential sections of the disc, such as trailers, extra materials or the disc menu, are only available in Dolby Digital 2.0 (2-channel) or PCM 2-channel mode. If the main title is playing and the letters in the Speaker/Channel Input Indicators are not lit for all speaker locations, look for an audio or language setup section in the disc's menu. Also, make sure your DVD player's audio output is set to the original bitstream rather than just PCM. Check the DVD player's output setting by stopping play of the disc and checking the DVD player's menu system.

As indicated in Table A12, different surround modes may only be available with certain input signals or bitstream formats. For any

incoming signal, only a limited number of surround modes are available. Although there is never a time when all of the AVR 354's surround modes are available, there is usually a wide variety of modes available for a given input.

Multichannel digital recordings usually are found in the 5.1-, 6.1- or 7.1-channel formats. The channels included in a 5.1-channel recording are front left, front right, center, surround left, surround right and LFE. The LFE channel is denoted as ".1" to represent the fact that it is not full-range, being limited to the low frequencies.

6.1-Channel recordings add a single surround back channel, and 7.1-channel recordings add surround back left and surround back right channels to the 5.1-channel configuration. New formats, such as Dolby TrueHD, Dolby Digital Plus, DTS-HD and DTS-HD Master Audio, are available in 7.1-channel configurations. The AVR 354 is able to play the new audio formats, delivering a more exciting home theater experience.

NOTE: To use the 6.1- and 7.1-channel surround modes, the AVR 354 must be configured so that the Surround Back channels are enabled. See the Manual Setup section on page 48 of the Advanced Functions section for more information.

Digital formats include Dolby Digital 2.0 (two channels only), Dolby Digital 5.1, Dolby Digital EX, Dolby Digital Plus, Dolby TrueHD, DTS-HD, DTS-HD Master Audio, DTS 5.1, DTS-ES (6.1 Matrix and Discrete), DTS 96/24, 2-channel PCM modes in 32kHz, 44.1kHz, 48kHz or 96kHz, and 5.1 or 7.1 multichannel PCM.

When a digital signal is received, the AVR 354 detects the encoding method and the number of channels. The number of channels encoded will appear briefly in the front-panel display as three numbers, separated by slashes (e.g., "3/2/.1").

The first number indicates the number of front channels in the signal:

"1" represents a monophonic recording, usually an older program that has been digitally remastered or, more rarely, a modern program for which the director has chosen a special effect.

"2" indicates the presence of the left and right channels, but no center channel.

"3" indicates that all three front channels (left, right and center) are present.

The second number indicates whether any surround channels are present:

"0" indicates that no surround information is present.

"1" indicates that a matrixed surround signal is present.

"2" indicates discrete left and right surround channels.

"3" is used with DTS-ES bitstreams to represent the presence of the discrete surround back channel in addition to the side surround left and right channels.

"4" is used with 7.1-channel digital formats, including Dolby TrueHD, Dolby Digital Plus, DTS-HD and DTS-HD Master Audio, to indicate the presence of two discrete side surround channels and two discrete back surround channels.

The third number is used for the LFE channel:

"0" indicates no LFE channel.

".1" indicates that an LFE channel is present.

The 6.1-channel signals – Dolby Digital EX and DTS-ES Matrix and Discrete – each include a flag meant to signal the receiver to decode the surround back channel.

For Dolby Digital EX materials, the incoming bitstream will be displayed as 3/2/.1 EX-ON.

For DTS-ES materials, the incoming bitstream will be displayed as 3/3/.1 ES-ON.

When a PCM signal is received, the PCM message, followed by the sampling rate of the signal (32kHz, 44.1kHz, 48kHz or 96kHz), will appear in the front-panel display.

In addition, the Speaker/Channel Input Indicators will indicate the number of channels discretely encoded in the signal by displaying a letter inside that channel's speaker box. A line will connect the SBL and SBR boxes when a 6.1-channel signal is detected, indicating that the same signal is playing through both speakers. The letters flash when no signal is present, such as when a DVD is paused. See Figure 63.

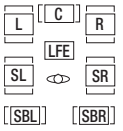


Figure 63 – Speaker/Channel Input Indicators

When only two channels – left and right – are present, the analog surround modes may be used to decode the signal into the remaining channels.

If you would prefer a different surround format than the native signal's digital encoding, press the Surround Modes Button to display the Surround Modes menu (see Figure 62).

The Auto Select option (the first line) uses the native signal's digital encoding, e.g., Dolby Digital or DTS. For 2-channel materials, the AVR defaults to Logic 7 Movie mode. If you prefer a different surround processing mode, select the appropriate line from the menu: Virtual Surround, Stereo, Movie, Music or Video Game.

Each line is set to a default surround mode:

- **Virtual Surround:** Dolby Virtual Speaker Reference
- **Stereo:** 7-channel stereo
- **Movie:** Logic 7 Movie
- **Music:** Logic 7 Music
- **Video Game:** Logic 7 Game

You may change each line's setting to a different surround mode. The choice of new modes depends on the number of speakers in your system.

- **Virtual Surround:** Dolby Virtual Speaker Reference or Wide
- **Stereo:** 2-channel stereo, 5-channel stereo or 7-channel stereo

- **Movie:** Logic 7 Movie, DTS Neo 6:Cinema, Dolby Pro Logic II Movie, Dolby Pro Logic IIx Movie
- **Music:** Logic 7 Music, DTS Neo 6:Music, Dolby Pro Logic II Music, Dolby Pro Logic IIx Music
- **Video Game:** Logic 7 Game, Dolby Pro Logic II Game, Dolby Pro Logic IIx Game

When one of the Dolby Pro Logic II Music modes is selected, access to the Edit submenu becomes available. This submenu may be used to adjust special settings available only in Music mode: Center Width, Dimension and Panorama.

Once you have programmed the default surround mode for each type of program, simply select the line from the Surround Modes menu any time you wish to override the AVR's automatic surround mode selection. The AVR will use the same surround mode the next time the source input is selected.

Please refer to Table A12 in the appendix for more information on which surround modes are available with different bitstreams.

NOTE: Dolby Digital 2.0 signals may also include a Dolby Surround flag indicating DS-ON or DS-OFF, depending on whether the 2-channel bitstream contains only stereo information, or a downmix of a multichannel program that can be decoded by the Dolby Pro Logic decoder in the AVR. By default, these signals are played in Dolby Pro Logic IIx Movie mode, but you may select another Dolby surround mode manually.

Dolby Surround Settings

Some additional settings are available for Dolby modes. Three settings are active only when the Dolby Pro Logic II or IIx Music modes have been selected. See Figure 64.

Figure 64 – Dolby Pro Logic II/IIx Music Mode Settings

Center Width: This setting affects how vocals sound through the three front speakers. A higher number (up to 7) focuses the vocal information tightly on the center channel. Lower numbers broaden the vocal soundstage across the three speakers. Use the ◀/▶ Buttons to change the setting.

Dimension: This setting affects the depth of the surround presentation, allowing you to "move" the sound toward the front or rear of the room. The setting of "0" is a neutral default. Setting "F-3" moves the sound mostly toward the front of the room, while setting "R-3" moves the sound mostly toward the rear. Use the ◀/▶ Buttons to change the setting.

Panorama: With the Panorama mode turned ON, some of the sound from the front speakers is moved to the surround speakers, creating an enveloping "wraparound" type of effect. Each press of the OK Button toggles the setting on or off.

Night Mode

Night mode is available with some Dolby Digital programs, if it has been encoded in the material. It compresses the peak sound levels, maintaining the intelligibility of the dialogue and quieter passages, while reducing the loudness of special effects and louder passages to avoid disturbing others. Night Mode is accessed from the Audio Effects menu. Press the Audio Effects Button and scroll down to the Night Mode line. Three levels of compression are available:

Off: At this setting, there is no compression, as the Night mode is deactivated.

Half: A mild compression is applied.

Full: More compression is applied.

Table A12 provides descriptions of all surround modes available on the AVR 354, along with the incoming bitstreams or signals that the particular mode may be used with. Feel free to experiment and simply cycle through all of the available modes at any time; you cannot cause any problems for the AVR 354 by doing so.

NOTE: To access 6.1- and 7.1-channel modes, such as Dolby Digital EX, DTS-ES, Logic 7 (7.1 modes), DTS Neo:6 (6.1 modes), and 7-channel Stereo, you must enable the surround back channels as explained in the Manual Setup section. You should not enable these channels if you don't have surround back speakers in your system.

Manual Setup

The AVR 354 is flexibly designed to be used with almost any loudspeakers available. The flexibility comes from the AVR 354's capability to be configured to match the characteristics of your particular speakers, and to compensate for the acoustic characteristics of your room.

The EzSet/EQ process automatically detects the capabilities of each speaker, and optimizes the AVR 354's performance in your system. However, if for some reason you are unable to run EzSet/EQ calibration, e.g., you have misplaced the microphone, or if you wish to make further adjustments to the settings made by the EzSet/EQ process, you may use the Manual Setup on-screen menus as described in this section.

Before beginning manual setup place your loudspeakers in their correct locations within the room (see Speaker Placement section), and connect them to the AVR. You will need the specifications for each of your speakers, which may usually be found in the owner's guide for the speakers or on the manufacturer's Web site. If necessary, contact the manufacturer to obtain the frequency range specification. Although the output-level setting portion of manual setup may be performed "by ear," we recommend that you purchase an SPL (sound-pressure level) meter at a local electronics store.

We suggest that you record your configuration settings in the appropriate places in Tables A3 through A11 in the appendix in case you need to reenter them after a system reset, or if the AVR's Master Power Switch is turned off or the unit is unplugged for more than four weeks.

NOTE: When using the AVR's Speaker Setup menus, we recommend selecting a video output resolution of 720p or higher to provide graphics that simplify configuration. Those menus will vary in appearance from the ones shown here.

Step One – Determine Speaker Crossover

Without using the EzSet/EQ process, the AVR 354 can't detect how many speakers you've connected to it; nor can it determine their capabilities. For this part of the system setup consult the speaker's technical specifications.

Locate the frequency response, which is usually given as a range, e.g., 100Hz – 20kHz (±3dB). This specification tells you whether the speaker is able to play sounds that are very high- or low-pitched, represented by the high and low frequencies. We are concerned here with the lowest frequency that each of your main speakers is capable of playing, which is 100Hz in this example. Use the Table A3 worksheet in the appendix to note this number as the crossover for that speaker (not the same as the crossover frequency listed in the speaker's specifications).

The subwoofer's frequency response will include only the very lowest frequencies, since the subwoofer is designed to play only bass materials. A typical frequency response for a subwoofer is 25Hz – 150Hz. In this case, the higher number should be noted in the worksheet.

This information is required to program the receiver's bass management, which determines which speakers the receiver will use to play back the low-frequency (bass) portion of the source program.

If you send the lowest notes to small satellite speakers, you won't hear these notes very well, and you may even damage the speaker by exceeding its capabilities. If you send the highest notes to the special-purpose subwoofer, you may not hear them at all.

With proper bass management, the AVR 354 divides the source signal at a crossover point. All information above the crossover point is played through the satellite speaker (front left/right, center, surround left/right, or surround back left/right), and all information below the crossover point is played through the subwoofer. This enables each loudspeaker in your system to perform at its best, delivering an enjoyable sound experience.

Step Two – Measure Speaker Distances

Ideally, all of your speakers would be placed in a circle, each at the same distance from the listening position. However, your room may not be ideal, and you may have had to place some speakers a little further away than others. This could affect the overall sound of the receiver, as sounds that are supposed to arrive simultaneously from different speakers blur due to different arrival times.

The AVR 354 has a delay adjustment that enables the receiver to compensate for real-world speaker placements.

Before you begin making adjustments, measure the distance from each speaker to the listening position, and note it in the Table A4 worksheet in the appendix. Even if all of your speakers are the same distance from the listening position, you should enter your speaker distances as described in Step Three.

Step Three – Manual Setup Menu

Now you are ready to program these adjustments into the receiver. It's best to sit in the usual listening position and make the room as quiet as possible.

With the receiver and video display turned on, press the AVR Button to display the menu system. Use the ▼ Button to move the cursor to the Speaker Setup line, and press the Set Button to display the Speaker Setup menu. See Figure 50.

If you have run the EzSet/EQ process, those results were saved. To tweak the EzSet/EQ results, or to configure the AVR from scratch, select Manual Setup. The screen shown in Figure 65 will appear.

Figure 65 – Manual Speaker Setup Menu

NOTE: All of the speaker setup submenus include the Exit and Back options as shown at the bottom of Figure 65. To return to a previous menu without making any changes, select Exit. To save the current settings, select the Back option.

If you previously saved EzSet/EQ results in this setup position and you wish to reconfigure the speakers from scratch, select the Reset option.

For best results, we recommend configuring the speakers in this order, although it may differ from the order in which the submenus appear in the Manual Speaker Setup menu: Number of Speakers, Crossover (Size), Sub Mode, Distance and Level Adjust.

Number of Speakers

Move the cursor to the Number of Speakers line and press the Set Button. See Figure 66.

Figure 66 – Number of Speakers Menu

The Number of Speakers menu lists each of the speaker groups. Program the correct setting for each group: ON when the speakers are present in the system, and OFF for positions where no speakers have been installed. The Front Left & Right speakers are always ON and may not be disabled. Any changes made to the system configuration will be reflected in the total number of speakers displayed at the top of the screen.

The setting for the surround back speakers includes a third option: Zone 2. The AVR 354 is capable of multizone operation, allowing placement of a pair of speakers in another room. Listeners in the remote room may enjoy either the same program as in the main room or a different source. The AVR 354's assignable surround back amplifier channels make multizone operation easier than ever, since an external power amplifier is not required. Simply select the Zone 2 option at this line, and connect the Surround Back Speaker Outputs to loudspeakers located in the remote room. The main room will be configured automatically for up to 5.1 channels. See the Multizone Operation section for more information.

The settings in this menu affect a number of aspects of the AVR's operation, including the remainder of the speaker setup process and the availability of various surround modes at any time.

When you have finished programming the number of speakers in the system, select the Back option to insure the settings are saved correctly. You may use the Back/Exit Button, and the settings will be saved.

Adjust Crossover Frequencies Menu

After you have programmed the number of speakers in the system, the AVR will return to the Manual Speaker Setup menu, similar to the one shown in Figure 50. Navigate to the Crossover (Size) line and press the OK Button to display the Adjust Crossover Frequencies menu (see Figure 67).

Figure 67 – Adjust Crossover Frequencies Menu

The AVR will only display those speaker groups which you programmed in the Number of Speakers menu.

Refer back to Step One, where you determined each speaker's crossover. For the main speakers, this is the lowest frequency the speaker reproduces well; and for the subwoofer, it's the highest.

For each main speaker, select one of the seven crossover frequencies: 40Hz, 60Hz, 80Hz, 100Hz, 120Hz, 150Hz or 200Hz. If the crossover frequency you determined in Step One is below 40Hz, select the first option, "Large". This setting doesn't refer to the speaker's physical size, but to its frequency response, which is also called "full range". This means the speaker is capable of playing sounds throughout the frequency spectrum, from the high pitches to the bass.

Specify the size of the subwoofer's transducer as 8, 10, 12 or 15 inches.

Make a note of each speaker group's crossover setting in Table A3 in the appendix.

When you have finished entering the settings, remember to select Back, not Exit.

Sub Mode

Move the cursor to the Sub Mode line to program bass management for the subwoofer. The subwoofer's setting depends upon how you programmed the front left and right speakers.

- If you set the front speakers to a numeric crossover frequency, the subwoofer setting will be LFE, and you won't be able to change it. All low-frequency information will always be sent to the subwoofer. If you don't have a subwoofer, we recommend that you either upgrade to full-range speakers or add a subwoofer to your system at the earliest opportunity.
- If you set the front speakers to LARGE, you may select between two possible settings for the subwoofer.
  - **L/R+LFE:** This setting sends all low-frequency information to the subwoofer, including both information that would normally

be played through the front left and right speakers and the special low-frequency effects (LFE) channel information.

- **LFE:** This setting plays low-frequency information contained in the left and right program channels to the front speakers, and directs only the LFE channel information to the subwoofer.

NOTE: If you are using a Harman Kardon HKTS Series speaker system, select the appropriate numeric crossover frequency for the Left/Right, Center, Surround and Surr Back lines, and the subwoofer will automatically be set to LFE.

The Speaker/Channel Indicators on the front panel of the receiver (see Figure 63) will display the speaker size settings as follows. For each speaker configured numerically, a single box will appear in the position for that speaker. For each speaker configured as LARGE, a double box will appear in its position. If a speaker is configured as OFF, no box will appear. The subwoofer will be indicated by a single box, or no box if no subwoofer has been configured. The letters inside the boxes appear when a digital signal is being received that has that channel discretely encoded. The letters flash when the signal is not present, such as when a DVD is paused. A line will connect the SBL and SBR boxes when a 6.1-channel signal is detected, indicating that the same signal is playing through both speakers.

Adjust Speaker Distance Menu

As explained above in Step Two – Measure Speaker Distances, sometimes the speakers are placed at different distances from the listening position, which can muddy the sound, as sounds are heard earlier or later than desired.

Even if all of your speakers are placed the same distance from the listening position, do not skip this menu.

On the Manual Speaker Setup menu, move the cursor to the Distance line and press the Set Button to display the Adjust Speaker Distance menu. See Figure 68.

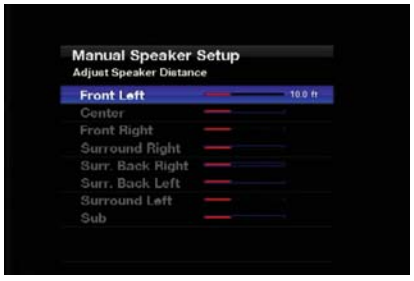


Figure 68 – Adjust Speaker Distance Menu

This menu requires you to enter the distance from each speaker to the listening position, which you measured in Step Two – Measure Speaker Distances and noted in Table A4 in the appendix.

The default unit of measurement is feet. If you wish to change the unit to meters, press the Back/Exit Button until you return to the main AVR menu. Scroll down to the System line, and select it to view the System Settings menu. Scroll down this menu to the General AVR Settings section, and select the Unit of Measure line. Press the OK Button to change the setting from Feet to Meters.

Use the ▲/▼ Buttons to move the cursor to the Front Left line, press the OK Button then use the ◀/▶ Buttons to change the measurement as needed. The values vary between 0 and 30 feet, with a default of 10 feet for all speakers. Use the ▲/▼ Buttons to move to each speaker in turn – Center, Front Right, Surround Right, Surround Back Right, Surround Back Left, Surround Left and Subwoofer, if present in your system.

NOTE: When the multiroom system is in use, if the surround back channels are assigned to the multiroom system, you will not be able to adjust the delay settings for these channels, and the cursor will skip past them.

Step Four – Setting Channel Output Levels Manually

For a conventional 2-channel receiver, the balance control enables the user to control the stereo imaging by adjusting the relative loudness of the left and right channels, as heard at the listening position.

With up to seven main channels plus a subwoofer, imaging becomes both more critical and more complex. Unlike the rotary balance control, the goal of the AVR 354's channel output adjustment process is to examine the output level of each channel independently and ensure that each is heard at the listening position with equal loudness.

If you followed the instructions in the Initial Setup section, then you let EzSet/EQ calibration handle this critical task for you, simply and automatically.

However, if you prefer to make these adjustments manually, the AVR 354's Adjust Speaker Levels menu allows you to do so, either using the system's test tone or while playing source material. In addition, this is the only method for adjusting the level of the subwoofer.

If you use a handheld SPL meter (available at many electronics stores), set it to the C-Weighting, Slow scale.

1. Make sure all speakers have been connected correctly.
2. Adjust the number of speakers, crossover, distance and sub mode for each speaker in your system as described in Step Three.
3. If you are using a handheld SPL meter with source material, such as a test disc or another audio selection, play it now and adjust the AVR's master volume control until the meter measures 75dB.
4. There are several methods of adjusting the channel output levels, using either the test tone or source materials. In all cases, you may measure the channel levels in one of two ways:

   a) By ear. Try to adjust the levels so that all channels sound equally loud.

   b) Using a handheld SPL meter set to the C-Weighting, Slow scale. Try to adjust each channel so that the meter reads 75dB.

The best method of setting the output levels is by running the EzSet/EQ process, as described in the Initial Setup section. If any finer adjustments are desired, we recommend using the menu system to make the adjustments while playing the AVR's built-in test tone and measuring the output using an SPL meter. Less effective would be to measure the output by ear.

Press the AVR Button to display the menu system, and then navigate to the Speaker Setup line. Press the OK Button to display the Speaker Setup menu. Select Manual Speaker Setup, press the OK Button, and then navigate to the Level Adjust line. Press the OK Button to display the Adjust Speaker Levels menu. See Figure 69.

Figure 69 – Adjust Speaker Levels Menu

All of the speaker channels will appear with their current level settings.

Reset Levels: If you wish to start by resetting all of the levels to their factory defaults of 0dB, scroll down to this line and press the OK Button. The levels will be reset.

If you are using an external source to set your output levels, simply navigate to each channel, press the Set Button and use the ◀/▶ Buttons to adjust the level as desired between –10dB and +10dB.

If you would like to set your levels using the AVR 354's internal test tone, adjust the TEST TONE line as follows.

Test Tone: This line determines whether the test tone is active. To begin the process of setting the levels, press the OK Button repeatedly to select the OFF, AUTO or MANUAL setting. Any time you manually move the cursor out of the channel listings area of the screen, this setting will automatically change to OFF, stopping the test tone.

When this setting reads AUTO, the test tone will automatically circulate to all channels, pausing for a few moments at each channel and then moving to the next channel several seconds later, as indicated by the highlight bar. You may adjust the level for any channel when the test tone is paused there by using the ◀/▶ Buttons. You may also use the ▲/▼ Buttons at any time to move the cursor to another line, and the test tone will follow the cursor.

When this setting reads MANUAL, the test tone will not move to the next channel until you use the ▲/▼ Buttons to move it.

NOTE: Setting the channel levels while one surround mode is active does not carry over to other mode groups. We recommend that after you have set the levels satisfactorily in one mode, you note the results and change to other surround modes. For those modes that don't reflect your level settings, you may either copy the settings you obtained (as a short cut), or redo the procedure to determine the correct settings.

When you have finished adjusting the speaker levels, select the SAVE option so that the settings will not be lost. Record the level settings in Table A3 in the appendix for future reference.

Audio Effects

Depending on the specific characteristics of your listening room, you may wish to adjust some of the audio settings, such as tone controls, to improve performance. Access these settings from the Audio Effects menu. Press the Audio Effects Button on the front panel or remote, and the screen shown in Figure 70 will appear. The menu may also be accessed from the Setup Source menu by pressing the Info Settings Button and selecting the Audio Effects line.

NOTE: The settings in the Audio Effects menu affect each source independently.

Figure 70 – Audio Effects Menu

Tone Control: This setting determines whether the treble and bass controls are active. When it's off, the tone controls are "flat", with no changes. When it's on, the bass and treble frequencies are boosted or cut depending upon the tone-control settings. When an analog audio source is in use and the 2-Channel Stereo surround mode is selected, setting the Tone Control to "Off" places the unit in analog bypass mode, with no digital processing of the analog signal.

Treble: Boost or cut the high frequencies by up to 10dB by using the ◀/▶ Buttons to change the temperature bar setting. The default setting is 0dB, at the center of the temperature bar.

Bass: Boost or cut the low frequencies by up to 10dB by using the ◀/▶ Buttons to change the temperature bar setting. The default setting is 0dB, at the center of the temperature bar.

LFE Trim: This setting may be used to attenuate the loudness of the subwoofer. The setting defaults to 0dB, which is the maximum. Press the ◀/▶ Buttons to reduce the level by up to 10dB; the setting will appear as a negative number.

Night Mode: This setting is used with specially encoded Dolby Digital programs to compress the signal so that louder passages do not disturb others, while dialogue remains intelligible.

- **Off:** For normal listening.
- **Half:** Applies moderate compression.
- **Full:** Applies the most compression.

When you have finished making adjustments in the Audio Effects menu, press the Audio Effects Button or the Back/Exit Button to clear the screen.

Video Adjustments

The AVR 354 uses leading-edge Faroudja DCDi Cinema video processing technology, with incoming video upscaled to 1080p (up to 1080i when component video outputs are used) for outstanding video quality, even with older analog video sources. The Faroudja DCDi Cinema Dual 3D comb filters and 10-bit video processing eliminates the jagged edges and moiré patterns seen with less advanced processing. Thanks to this "Torino" video processing chip, on-screen graphics may be generated in high definition, and blended with the incoming video. This not only delivers crisp, clear information messages, it allows you to continue to watch a program while making system adjustments.

The video processor automatically provides the best picture based on the capabilities of your video display and the incoming source video signals. However, you may experiment with the Video Modes menu adjustments to try to improve the picture further.

Video Modes

After you have adjusted the picture settings on your video display, additional adjustments may be made to the AVR, if necessary, to further improve the picture. Access these settings from the Video Modes menu. Press the Video Modes Button on the front panel or remote, and the screen shown in Figure 71 will appear. The menu may also be accessed from the Setup Source menu by pressing the Info Settings Button and selecting the Video Modes line.

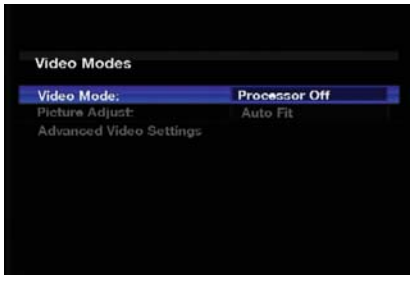


Figure 71 – Video Modes Menu

Video Mode: The default setting of Processor Off passes the video signal through to the display without any processing. Select one of these processing options to optimize the picture for the current program by applying adjustments to the brightness, contrast, color and sharpness:

- **Sports:** For sporting events.
- **Nature:** For programs shot outdoors, in a natural setting.
- **Movie:** For movies and many television broadcasts.
- **Custom:** Allows manual adjustment of the picture settings. The Brightness, Contrast, Color and Sharpness settings will appear on screen as sliders with values ranging from 0 to 100. The default setting for each adjustment is 50. Use the ◀/▶ Buttons to change each setting's value.

Picture Adjust: Use this setting to change the aspect ratio of the displayed image.

When displaying widescreen (16:9) images on a full screen (4:3) device, letterbox format will be used, in which black bars may appear above and below the image.

When displaying full screen images on a widescreen device, black or gray bars may appear to the left and right of the image (pillarboxing).

Some displays, especially plasma and CRT monitors, may suffer from "burn-in" when the same image, such as the horizontal or vertical bars, is left on screen for a long period of time. Use this setting to adjust the picture so that it fills the display's screen. The options are:

- **Auto Fit:** The AVR automatically adjusts the image as required to fit the display's capabilities.
- **Height Fit:** Adjusts the image to eliminate any bars above or below it. Bars may remain at the sides.
- **Width Fit:** Adjusts the image to eliminate any bars on the sides. Bars may remain above and below the image.
- **Zoom 1x:** Displays the image as received from the source. If the image is in the 4:3 aspect ratio, on widescreen displays pillarbox format may be used. If the image is in the 16:9 aspect ratio, on full screen (4:3) displays letterbox format may be used.
- **Zoom 2x:** Stretches the image evenly to completely fill the screen. The outer portions of the image may be cropped.

Feel free to experiment with this setting for each source until you find a pleasing display format for each program.

Advanced Video Settings: Press the ▶ or OK Button to display the Advanced Video Modes submenu (see Figure 72).

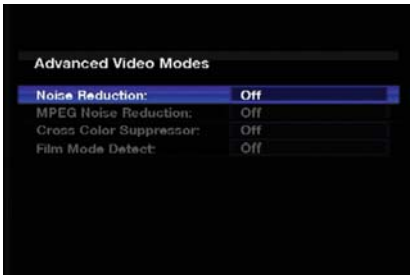


Figure 72 – Advanced Video Modes Menu

Noise Reduction: Change this setting from its default of Off to Low, Medium or High to filter out signal noise.

MPEG Noise Reduction: This setting is designed to address two specific types of video distortion, mosquito noise and blocking artifacts. If you see haziness or shimmering around the edges of objects or the scrolling credits in a film, or if the image appears to "pixellate" into blocks, change the MPEG Noise Reduction setting from its default of Off to the Low, Medium or High setting to improve the picture.

Cross Color Suppressor: Turn this setting on to remove cross color artifacts, which can occur when high-frequency luminance (brightness) signals are misinterpreted as chroma (color) signals, which can cause unwanted flickering, flashing colors or rainbow patterns.

Film Mode Detect: While normally left off, turn this setting on to compensate for authoring errors in the process of converting film programs to video.

How to Adjust the Custom Picture Settings

Set the Video Mode to Custom to display the picture settings as shown in Figure 73.

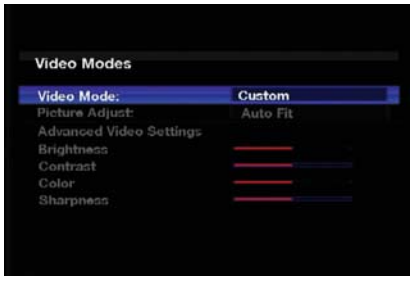


Figure 73 – Video Modes Custom Processing

With a color bar test pattern screen from a test disc or other source showing on your video display, the following adjustments may be made:

- The proper color intensity setting on your TV.
- Proper color adjustments using the color bars, which should be (left to right) black, white, yellow, cyan (turquoise), green, magenta, red, blue, black.
- The proper color transition, seen as sharp separation of the bars.
- The performance of the color circuits in your TV (with "Video" signals); bar edges should show no vertical crawling dots.

With the gray scale and the black/white fields below the color bars, the brightness and contrast of your screen can be adjusted.

Brightness Adjustment

1. Turn down the color control on your TV until the color bars appear in black and white.
2. Adjust the contrast to the lowest level where you still can see all gray scale bars separately and clearly.
3. Adjust the brightness so that the bars in the gray scale are all visible. The bar farthest to the left has to be as black as possible rather than gray but the next gradation must clearly be distinct from it. All the bars in the gray scale should be gradually and evenly changing from black to white, left to right.

Contrast Adjustment

1. Adjust the contrast on your TV until you see a bright white bar in the lower right corner of the screen and a deep-dark-black bar to the left. The optimal contrast setting will depend on your preference and the surrounding light in the TV room.
2. If the brightness of the white bar no longer increases when the contrast is turned up or the borders of white letters bloom (overlight) into the black areas (drastically decreasing the sharpness of the type), the contrast has been turned up too much. Reduce the contrast until these effects disappear and the video still looks realistic.
3. If you are watching TV with ambient daylight, adjust the contrast so that a normal video picture has about the same look as the surroundings in your room. That way the eye is relaxed when watching the TV picture. This contrast setting may be reduced when the surrounding light is dimmed, thereby usually improving the sharpness of a video significantly.
4. The gray scale in the middle line needs to have the same clear difference between each bar as before the contrast adjustment. If not, go back to "Brightness Adjustment" and repeat Step 3 and then "Contrast Adjustment," making only minor adjustments each time for optimization.

Color Adjustment

1. When the brightness and contrast are set optimally, adjust the color control to the level of your preference. Set the level so that the colors look strong but still natural, not overdone. If the color level is too high, depending on the TV, some of the bars will seem wider or the color intensity will not increase when the control is turned up. Then the color control must be reduced again. Ultimately, you also should test the color intensity with a video – e.g., pictures of natural faces, flowers, fruit and vegetables, and other common natural articles for an optimal setting of the color intensity.
2. Refer to the large white bar below the gray scale to tweak the warmth of the picture. Every viewer has a preference as to how the glow of the picture should be. Some prefer a colder picture, some a warmer glow. The Tint function on your TV and the white bar can be used to control this. Adjust the Tint to the level where you feel the white color has the tone you prefer.

Sharpness Adjustment

Contrary to intuition, the picture will appear sharper and clearer with the sharpness backed off from the maximum setting. Reduce the sharpness setting on your television, and the setting on the AVR 354 if necessary, to minimize the appearance of any white lines between the bars in the gray scale portion of the test screen.

Convergence and Edge Focus

The crosshatch pattern that surrounds the test screen may be used to evaluate edge focus and convergence in front- or rear-projection video displays. However, the controls used to adjust these parameters are often not user-accessible. In any event, these adjustments are extremely complex, and require proper training and experience to avoid worsening the situation. Therefore, it is recommended that if you are unable to improve the picture using the available controls, contact the video display manufacturer's authorized service representative for assistance.

When you have finished making any video adjustments, press the Back/Exit Button to back out of the menu system.

ADVANCED FUNCTIONS

Multizone Operation

The AVR 354 offers the benefits of multizone operation, a rarity in a receiver this affordable. With the multizone system in use, you may enjoy an exciting 5.1-channel home theater presentation in the main listening area, while others listen to the same materials or an entirely different presentation in another room.

Although installation of a multizone system is not complicated, it requires running wires inside walls. We urge you to check your local building codes and comply with the requirements for in-wall wiring systems to prevent the possibility of a dangerous situation. If you have any questions about installing a multiroom system, we strongly recommend that you contact a professional custom installer.

Installing a Multizone System

A typical multizone system consists of only one remote room in the remote zone. That is, you connect only one pair of loudspeakers to the AVR 354, placing those speakers in the remote room the same way you would place the front left and right speakers in the main listening room. It is not recommended that you place the left and right multizone speakers in different rooms.

To use the AVR 354 with more than one remote room, purchase a multichannel external amplifier that enables you to connect several pairs of loudspeakers. However, the AVR 354 only outputs one remote zone, meaning that only one signal is sent through the multizone system. All remote rooms will hear the same source, even when a multichannel amplifier is used.

There are two ways of connecting the remote speakers to the AVR 354:

a) Connect the speakers to the left and right Surround Back/Zone 2 Speaker Outputs on the rear panel of the AVR 354. This is the simplest type of multizone system. However, it is not recommended for long speaker-wire runs (e.g., more than 25 feet), as the audio signal tends to degrade over long distances. If your application would require a long speaker-wire run, consider option b below.

b) Purchase an external amplifier. Connect the Surround Back/Zone 2 Preamp Outputs or the Zone 2 Audio Outputs to the amplifier's inputs. You may place the amplifier either in the main listening room or the remote room. Placing the amplifier in the main listening room would require the use of long speaker wires to reach the remote room, while placing the amplifier in the remote room calls for the opposite – long interconnect cables and short speaker wires.

When you use either the Surround Back/Zone 2 Speaker Outputs or the Surround Back/Zone 2 Preamp Outputs for a multizone system, you will not be able to use the surround back speakers with your main system, which will then be limited to 5.1 channels. However, when the multizone system is turned off, you may reassign your remote speakers to the main listening room for 7.1-channel operation.

You may install an optional remote infrared (IR) receiver in the remote room and connect it to the Zone 2 IR Input on the back of the receiver. This lets you use the included Zone 2 remote, a keypad or another control device to turn the multizone system on or off, select a source input, and operate any source devices that are connected in daisychain fashion to the AVR 354's Remote IR Output.

You may use the above connection methods simultaneously to increase the total number of remote rooms in your system. Remember that sending control commands from one room in the system will affect the entire remote zone of the multizone system.

Operating the Multizone System

The AVR 354's multizone system is accessed using the on-screen Zone 2 menu. Press the AVR Button to display the menu System, and use the ▲/▼ Buttons to navigate to the Zone 2 line. Press the OK Button to display the Zone Control menu. See Figure 74.

Figure 74 – Zone 2 Menu

Status: This line is used to turn the multizone system on or off. When no one is listening in the remote room, leave this setting at the default of OFF.

Source: This line indicates the source input selected for the remote zone. You may select any source input for which a device has been connected to the AVR 354, even when a different source is being enjoyed in the main listening area. However, if the tuner has been selected for simultaneous operation in both the main listening area and the remote zone, listeners in both areas will hear the same radio station.

NOTE: Only analog audio sources are available to the multizone system. To hear digital devices, such as a CD player, in the remote zone, follow these steps:

1. In addition to a digital audio connection, connect the source device's analog audio outputs to any available analog audio inputs on the AVR, noting in Table A5 in the appendix which set of inputs was used.
2. In the Setup Source menu, leave the Audio Source setting at the digital audio input. However, scroll down to the Zone 2 Audio setting and select the analog audio source used in step 1.

Volume: The volume is controlled separately for the remote zone.

Surround Back Amps: This line is used to reassign the surround back channels to the multizone system, enabling you to connect speakers for a remote room without using an external amplifier (unless you are connecting the Surround Back/Zone 2 Preamp Outputs to an external amplifier to power the speakers). When this line is set to Zone 2, you may only configure the main listening room for up to 5.1 channels. EzSet/EQ will only configure the main 5.1-channel system. Use the Manual Setup

section of the Speaker Setup menu to configure the remote speakers with this setting at Main Room, and return this setting to Zone 2 when you have finished.

To operate the multizone system using the main remote, slide the Zone Select Switch at the bottom of the remote to the "2" position (see Figure 75). To select a zone using the Zone 2 remote, press the Zone Selector, and the Zone Indicator will turn green when the remote is set to operate Zone 1, or red to operate Zone 2.

Figure 75 – Zone Select Switch

System Settings

The AVR 354 offers system settings that allow you to make the receiver easier to use rather than directly affecting performance. These settings may be accessed from the System Settings menu, which is selected by pressing the AVR Button and navigating to the System line. Press the OK Button to display the System Settings menu. See Figure 76.

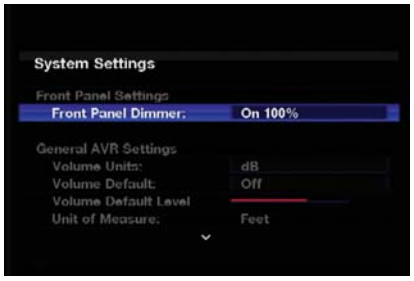


Figure 76 – Systems Settings Screen

Front Panel Dimmer: Some people find the front-panel messages distracting while watching a movie. The AVR 354 allows you to dim the front-panel lighting or turn it off altogether. When the display is partly or fully dimmed, it will return to full brightness for five seconds whenever a command is entered, and then it will dim again. Select On 100% for full brightness, dim to 50% or 25% of full brightness or select Off to fully darken the display. The light inside the Volume Control will go out when the display is partly or fully dimmed, but the Power Indicator will always remain lit to remind you that the AVR is powered on.

General AVR Settings

Volume Units: Select whether volume is displayed in the conventional decibel scale or on a numeric scale from 0 to 100. When the decibel scale is used, 0dB is the maximum volume, with lower volumes measured as negative values.

Volume Default and **Volume Default Level:** These two settings are used together to program a volume level the AVR will always switch to when turned on. This feature avoids discomfort for listeners in case the last user turned the volume very high.

Turn Volume Default on, and then set the Volume Default Level to the desired turn-on volume.

Unit of Measure: This setting only affects the speaker-distance settings when performing Manual Speaker Setup. Select between meters and feet.

iPod Charging: When The Bridge II is connected and an iPod is docked, the device's battery charges as long as the AVR is powered on. When this setting is turned on, the device will continue to charge after the AVR has been powered down to Standby mode.

Language: Select the preferred language for the AVR's on-screen menus and displays: English, French, Spanish or German.

HDMI Audio to TV: This setting determines whether audio signals received through any of the HDMI Inputs are passed through the HDMI Output to the video display. In normal operation, leave this setting Off, as audio will be played through the AVR rather than the video display's built-in speakers. However, sometimes you may wish to use the TV by itself, without using the complete home theater system. For those occasions change this setting to On. You may always mute the TV's speakers when using the AVR for audio.

Resolution to Display: This setting reflects the video output resolution. See page 38 in the Initial Setup section for more information.

Menu Appearance

OSD Transparency: This setting allows you to select whether video programs will be visible when the menu system is in use. Select Normal for a fully-transparent background, Medium for the menu background to be partially visible or Opaque to block the view of any video programs while the menus are on screen.

Volume Status Messages: When the AVR is turned on, the volume is adjusted or the source is changed, or if a change in the input signal is detected, a status message will be displayed on screen. Use this setting to select how long the message remains visible. The setting varies from 2 to 10 seconds, with a default of 3 seconds.

Menus: Some menu settings only remain in effect during the current listening session, including the settings in the Surround Modes, Video Modes and Audio Effects menus. This setting governs how long these menus will remain visible after your last adjustment, varying from 2 to 10 seconds, with a default of 3 seconds.

Setup and Slide-In Menus: This setting determines how long the setup menus (Main Menu, Speaker Setup Menu, Zone 2 Menu, all slide-in menus) remain visible after your last adjustment. Select a timeout period of 5, 10 or 15 (the default) minutes, or no timeout, which leaves the menus on screen until you manually clear them. We recommend setting some timeout period to avoid the possibility of burn-in damage to plasma or CRT displays.

Screen Saver: Use this setting to program a timeout period for no activity (with no menus displayed) before the AVR's built-in screen saver begins. Select a period of 5 (the default), 10 or 20 minutes, or turn off the screen saver. We recommend setting some timeout period to avoid the possibility of burn-in damage to plasma or CRT displays.

Advanced Remote Control Functions

The AVR 354 remote control not only operates the AVR 354, but it also serves as a universal remote that may be programmed to operate many other home theater components, as described in the Installation section. Each time you select one of your other components, the AVR remote switches to the control functions for that component. Since many buttons have unique functions for each component, refer to the Function List (Table A13 in the appendix) for assistance in operating your other components. The function of each button will not necessarily correspond to the label printed on the button.

Punch-Through Programming

The AVR 354 remote's punch-through feature allows you to select one component for the remote to operate, while simultaneously setting certain groups of controls to operate another component. For example, while using the AVR to control surround modes and other audio functions, you may operate the transport controls of your DVD player. Or while using the remote to control video functions on your TV, you may use your cable box to change channels.

To program punch-through control while operating any device:

1. Press and hold the Source Selector (or AVR selector) for the main device the remote will be operating. The Source Selector will light, go dark and then light up again, indicating the remote is in Program mode and that you may release the button.
2. Select the type of punch-through programming.
   a) To program channel control punch-through, press the Channel Up Button.
   b) To program transport control punch-through, press the Play Button.
3. Press the Source Selector for the device whose channel or transport controls you would like to be active while operating the device you selected in the first step. The Source Selector will flash to confirm the programming.

For example, if you wish to watch your TV while changing channels using your cable box, first press and hold the TV Button until it lights. Then press the Channel Up Button, followed by the CBL/SAT Button.

To undo punch-through programming, follow the same steps as above, but press the same Source Selector in Steps 1 and 3.

> **NOTE:** The remote always allows volume-control punch-through, since the Volume and Mute controls are dedicated to the AVR.

Activities (Macros)

Activities are used to program sequences of up to 19 commands that are executed with a single button press. Activities are well suited for power on and off commands, or to send out a favorite multidigit channel number with one button press, or to have the ability to send out a code sequence to control another device while the remote is operating one device, but with more flexibility than the built-in punch-through controls. Up to eleven activities may be programmed.

> **NOTE:** Use caution when programming complicated activities. It isn't possible to program a pause or delay before sending commands after Power On, and the component may not be ready to respond to commands instantaneously after powering on.

To program, or "record" an activity, follow these steps:

1. To enter Program mode, simultaneously press and hold the Activity Button and the Alphanumeric Key or AVR Power On Button to which the activity will be assigned.
2. Press the Input (or AVR) Selector for each device before you enter commands to be transmitted to that device. This step counts as one of the 19 commands allowed for each macro.
3. For the Power On command, press the AVR or Device Power On Button as appropriate.
4. Press the AVR or Device Power Off Button to program the Power Off command.
5. Press the Activity Button to end the programming process, and the last Source Selector (or the AVR Settings Button) will flash three times to indicate that the activity has been programmed.

It isn't possible to "edit" a command within a macro. However, you may erase the macro as follows:

1. Simultaneously press and hold the Activity Button and the Numeric Key or AVR Power On Button assigned to the activity until the Source Selector or AVR Settings Button lights.
2. Press the Activity Button to erase the macro.

Learning

If you have programmed a product's codes into the remote and find that some functions are missing, the AVR 354 remote may "learn" individual codes if you have the product's original remote. See page 31 for instructions on learning remote codes.

Resetting the Remote

To reset the remote to its factory defaults, simultaneously press and hold the TV Source Selector and the "0" Alphanumeric Key. When the TV Button re-lights, enter the code "333". When the TV Button goes out, and all of the Source Selectors flash, the remote will have been fully reset.

Processor Reset

There may be instances when you wish to fully reset the AVR 354 to its factory defaults, or the unit may behave erratically after a power surge.

To correct erratic behavior, first try turning the Master Power Switch off and unplugging the AC power cord for at least three minutes. Plug the cord back in and turn the receiver back on. If this doesn't help, try a system reset.

NOTES:

- A system reset erases all user configurations, including video resolution, speaker and level settings, and tuner presets. After a reset, you will need to reenter all of these settings.
- The RS-232 Reset Button on the rear panel of the AVR 354 does not perform a system reset. DO NOT press the RS-232 Reset Button.

To reset the AVR 354, place the receiver in Standby mode (press the front-panel Standby/On Switch so that the Power Indicator turns amber). Then press and hold the front-panel OK Button for at least five seconds until the RESET message appears in the display.

Follow the directions in the note on page 34 to restore the picture if necessary.

If the receiver still does not function correctly after a processor reset, contact an authorized Harman Kardon service center for assistance. Authorized service centers may be located by visiting the Web site at www.harmankardon.com.

Memory

If the AVR 354 is unplugged or experiences a power outage, it will retain user settings for up to four weeks.

TROUBLESHOOTING GUIDE

SYMPTOM	CAUSE	SOLUTION
Unit does not function when Main Power Switch is pushed	• No AC Power	• Make certain AC power cord is plugged into a live outlet • Check to see whether outlet is switch-controlled
Display lights, but no sound or picture	• Intermittent input connections • **Mute** is on • Volume control is down	• Make certain that all input and speaker connections are secure • Press **Mute Button** • Turn up volume control
No sound from any speaker; PROTECT message appears on front panel	• Amplifier is in protection mode due to possible short • Amplifier is in protection mode due to internal problems	• Check speaker wire connections for shorts at receiver and speaker ends • Contact your local Harman Kardon service center
No sound from surround or center speakers	• Incorrect surround mode • Input is monaural • Incorrect configuration • Stereo or Mono program material	• Select a mode other than Stereo • There is no surround information from mono sources • Check speaker mode configuration • The surround decoder may not create center- or rear-channel information from nonencoded programs
Unit does not respond to remote commands	• Weak batteries in remote • Wrong device selected • Remote sensor is obscured	• Change remote batteries • Press the AVR selector • Make certain front-panel sensor is in line of sight of remote or connect an optional remote sensor
Intermittent buzzing in tuner	• Local interference	• Move unit or antenna away from computers, fluorescent lights, motors or other electrical appliances
Letters flash in the channel indicator display and digital audio stops	• Digital audio feed paused	• Resume play for DVD • Check that the correct digital input is selected
Surround Back Speaker settings cannot be accessed, and test tone does not play through Surround Back Speakers	• Multizone system has been turned on, and the surround back channels were reassigned to multizone operation	• Use the menu system to access the Zone 2 menu and reassign the surround back channels to the main room.
The XM Preview Channel (001) is silent	• XM antenna is not plugged in • XM antenna is not located in such a way as to enable reception	• Make sure you are using a home audio XM antenna module designed for use with XM Ready home audio equipment, and that the module is plugged into the XM Radio Jack on the rear panel of the receiver. • The XM Antenna module needs to be placed with an unobstructed view of the southern sky, or within range of an XM terrestrial repeater. If necessary, purchase an extension cable from your XM Radio dealer.
Unable to activate Program mode on remote	• Source Selector not held for at least 3 seconds	• The selector will light as you initially press it, and go dark as you hold it down. Wait at least 3 seconds for the selector to light up again.
Remote behaves erratically	• Buttons are pressed too hard	• Always press remote control buttons as gently as possible.
Remote buttons light, but AVR does not respond	• Remote is in Zone 2 mode	• Slide the Zone Switch at the bottom of the remote to the Zone 1 position

Additional information on troubleshooting possible problems with your AVR 354, or installation-related issues, may be found in the list of "Frequently Asked Questions", which is located in the Product Support section of our Web site at www.harmankardon.com.

Appendix – Default settings, worksheets, remote product codes

Table A1 – Recommended Source Component Connections

Device Type	AVR 354 Source	Digital Audio Connection	Analog Audio Connection	Video Connections
Cable TV, satellite TV, HDTV or other device that delivers television programs	CBL/SAT	HDMI 2	Analog 1	HDMI 2
DVD Audio/Video, SACD, Blu-ray Disc, HD-DVD player	DVD	HDMI 1	Analog 2	HDMI 1
Media Server, including Harman Kardon DMC 1000	Media Server	Optical 2	Analog 5	S-Video 1
TV	TV	Optical 1	Analog 3	Component 1*
Video game console	Game	Coaxial 1	Analog 4	Composite 1
Any audio or video device, e.g., CD player, camcorder, cassette deck	AUX	Coax Front	Analog Front	Composite Front (not used for audio-only devices)
Recorder	Any	Coaxial 1 or 2 input and Coaxial Output	Analog 4 inputs and outputs	Composite OR S-Video 2 input and output
iPod	The Bridge II	None	The Bridge II	The Bridge II for photo- and video-capable iPod models

*Make this connection only when using the TV source for a non-display device. Do not connect your television's or video display's video output to the AVR at any time.

Table A2 – Source Setting Defaults

	Cable/Sat	DVD	Media Server	Radio	TV	Game	AUX	The Bridge
Surround Modes (Auto Select)	Logic 7 Movie	Logic 7 Movie	Logic 7 Movie	Logic 7 Movie	Logic 7 Movie	Logic 7 Movie	Logic 7 Movie	Logic 7 Movie
Video Input	HDMI 2	HDMI 1	S-Video 1	N/A	Component 1	Composite 1	Composite Front	The Bridge II
Audio Input	HDMI 2	HDMI 1	Optical 2	N/A	Optical 1	Coaxial 1	Coaxial Front	The Bridge II
Resolution to Display	480i	480i	480i	480i	480i	480i	480i	480i
Audio Auto Polling	Analog 1	Analog 2	Analog 5	N/A	Analog 3	Analog 4	Analog Front	The Bridge II
Zone 2 Audio	Analog 1	Analog 2	Analog 5	N/A	Analog 3	Analog 4	Analog Front	The Bridge II

APPENDIX

Table A3 – Speaker/Channel Setting Defaults

Audio Input	All Digital and 2-Channel Analog Audio Inputs	6-/8-Channel Analog Audio Inputs*	Your Settings
Left/Right Speakers	ON	ON	
Center Speaker	ON	ON	
Left/Right Surround Speakers	ON	ON	
Left/Right Surround Back Speakers	ON	ON	
Subwoofer	ON	ON	
Left/Right Speakers Crossover	100Hz	Large*	
Center Speaker Crossover	100Hz	Large*	
Left/Right Surround Speakers Crossover	100Hz	Large*	
Left/Right Surround Back Speakers Crossover	100Hz	Large*	
Subwoofer Mode	L/R + LFE	N/A*	
Subwoofer Size	8 inch	N/A*	
Front Left Level	0dB	0dB	
Center Level	0dB	0dB	
Front Right Level	0dB	0dB	
Surround Right Level	0dB	0dB	
Surround Back Right Level	0dB	0dB	
Surround Back Left Level	0dB	0dB	
Surround Left Level	0dB	0dB	
Sub Level	0dB	0dB	

* Note: The 6-/8-Channel Inputs are "direct" inputs whose signals are passed directly to the volume control without any bass management processing. Thus, the speakers are always full-range and cannot be adjusted. The settings are global for the remaining audio inputs.

Table A4 – Delay Setting Defaults

Speaker Position	Distance From Speaker to Listening Position	Your Delay Settings
Front Left	10 feet	
Center	10 feet	
Front Right	10 feet	
Surround Right	10 feet	
Surround Left	10 feet	
Surround Back Right	10 feet	
Surround Back Left	10 feet	
Subwoofer	10 feet	
A/V Sync Delay	0mS	

Table A5 – Source Settings

	Cable/Sat	DVD	Media Server	Radio	TV	Game	AUX	The Bridge
Surround Modes								
Video Input								N/A
Audio Input								N/A
Resolution to Display								
Adjust Lip Sync								
Change Name								N/A
Audio Auto Polling								N/A
Zone 2 Audio								N/A

Table A6 – Audio Effects Settings

	Default	Cable/Sat	DVD	Media Server	Radio	TV	Game	AUX	The Bridge
Tone Control	Off								
Treble	0dB								
Bass	0dB								
LFE Trim	0dB								
Night Mode	Off								

Table A7 – Video Modes Settings

	Default	Cable/Sat	DVD	Media Server	Radio	TV	Game	AUX	The Bridge
Video Mode	Processor Off								
Brightness*	50								
Contrast*	50								
Color*	50								
Sharpness*	50								
Picture Adjust	Auto Fit								
Noise Reduction**	Off								
MPEG Noise Reduction**	Off								
Cross Color Suppressor**	Off								
Film Mode Detect**	Off								

*Note: These settings are only available when the Video Mode is set to Custom.
**Note: These settings are only displayed when Advanced Video Settings is selected.

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Table A8 – Surround Modes

	Default	Cable/Sat	DVD	Media Server	Radio	TV	Game	AUX	The Bridge
Auto Select	Logic 7 Movie or native digital format								
Virtual Surround	Dolby Virtual Speaker Reference								
Stereo	7 CH Stereo								
Movie	Logic 7 Movie								
Music	Logic 7 Music								
Game	Logic 7 Game								
Center Width*	0								
Dimension*	0								
Panorama*	Off								

*Note: These settings are only available when Dolby Pro Logic II or IIx Music mode has been selected. Access these settings by selecting the Edit option.

Table A9 – Remote Control Codes

Source Input	Device Type (if changed)	Product Code
Cable/Sat		
DVD		
Media Server		
TV		
Game		
AUX		

Table A10 – System Settings

Feature	Default	Your Settings
Front Panel Dimmer	On 100%	
Volume Units	dB	
Volume Default	Off	
Volume Default Level	-25dB	
Unit of Measure	Feet	
iPod Charging	Off	
Language	English	
HDMI Audio to TV	Off	
OSD Transparency	Normal	
Volume/Status Messages	3 seconds	
Menus	5 seconds	
Setup and Slide-In Menus	15 minutes	
Screen Saver	5 minutes	

Table A11 – Zone 2 Settings

Source Input	Default	Your Settings
Status	Off	
Source	Cable/Sat	
Volume	-25dB	
Surround Back Amps	Main Room	

Table A12 – Surround Modes

Surround Mode	Description	Incoming Bitstream or Signal
Dolby Digital	Provides up to five separate main audio channels and a dedicated low-frequency effects (LFE) channel. May be encoded for Night mode, which allows the user to apply a compression setting that maintains intelligibility of softer passages while reducing the loudness of dynamic passages to avoid disturbing others.	• Dolby Digital 1/0/.0 or .1, 2/0/.0 or .1, 3/0/.0 or .1, 2/1/.0 or .1, 2/2/.0 or .1, 3/2/.0 or .1 • Dolby Digital EX (played as 5.1) • Dolby Digital Plus decoded and delivered via coax or optical connection.
Dolby Digital EX	An expansion of Dolby Digital 5.1 that adds a surround back channel which may be played through one or two surround back speakers. May be manually selected when a non-EX Dolby Digital stream is detected.	• Dolby Digital EX • Dolby Digital 2/2/.0 or .1, 3/2/.0 or .1
Dolby Digital Plus	An enhanced version of Dolby Digital encoded more efficiently, Dolby Digital Plus has the capacity for additional discrete channels and for streaming audio from the internet, all with enhanced audio quality. Source material may be delivered via an HDMI connection, or decoded to Dolby Digital or PCM and transmitted via S/P-DIF coaxial or optical digital audio.	• Dolby Digital Plus via HDMI connection (source device decodes to Dolby Digital when a coax or optical connection is used).
Dolby TrueHD	Dolby TrueHD is an expansion of MLP Lossless™ audio, the same format used on DVD Audio discs. Dolby TrueHD adds the features found in Dolby Digital, such as night mode settings, while delivering fully lossless audio that is a true reproduction of the studio master recording.	• Blu-ray Disc or HD-DVD encoded with Dolby TrueHD, delivered via HDMI.
Dolby Digital Stereo	Delivers a 2-channel downmix of Dolby Digital materials.	• Dolby Digital 1/0/.0 or .1, 2/0/.0 or .1, 3/0/.0 or .1, 2/1/.0 or .1, 2/2/.0 or .1, 3/2/.0 or .1 • Dolby Digital EX
Dolby Pro Logic II Mode Group	Analog decoder that derives five full-range, discrete main audio channels from matrix surround-encoded or 2-channel analog sources. Four variants are available.	See below.
Dolby Pro Logic II Movie	Variant of Dolby Pro Logic II that is optimized for movie and television programs.	• Dolby Digital 2.0 or 2.1 • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Dolby Pro Logic II Music	Variant of Dolby Pro Logic II that is optimized for music selections. Allows adjustment of sound field presentation in three dimensions: • Center Width (adjusts width of vocal soundstage) • Dimension (adjusts depth of soundstage) • Panorama (adjusts wraparound surround effect)	• Dolby Digital 2.0 or 2.1 • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)

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Surround Mode	Description	Incoming Bitstream or Signal
Dolby Pro Logic II Game	Variant of Dolby Pro Logic II that emphasizes use of the surround channels and subwoofer for total immersion in the video gaming experience.	• Dolby Digital 2.0 or 2.1 • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Dolby Pro Logic	Original version of Dolby Pro Logic that steered a mono signal containing information below 7kHz to the surround channels.	• Dolby Digital 2.0 or 2.1 • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Dolby Pro Logic IIx Mode Group	An expansion of Dolby Pro Logic II that adds a surround back channel which may be played through one or two surround back speakers. The Dolby Pro Logic IIx modes may be selected not only with Dolby Digital bit-streams, but thanks to the AVR 354's post-processor, they may also be used with some DTS bitstreams to add a surround back channel to 5.1 modes.	
Dolby Pro Logic IIx Movie	This mode is similar to Dolby Pro Logic II Movie, with an added surround back channel.	• Dolby Digital 2/0/.0 or .1, 2/2/.0 or .1, 3/2/.0 or .1, EX • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Dolby Pro Logic IIx Music	This mode is similar to Dolby Pro Logic II Music, including the availability of center width, dimension and panorama adjustments. Dolby Pro Logic IIx Music adds a surround back channel.	• Dolby Digital 2/0/.0 or .1, 2/2/.0 or .1, 3/2/.0 or .1, EX • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Dolby Pro Logic IIx Game	This mode is similar to Dolby Pro Logic II Game, with the added benefit of a surround back channel.	• Dolby Digital 2/0/.0 or .1 • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz or 48kHz)
Dolby Virtual Speaker Mode Group	Simulates 5.1 channels when only two speakers are present, or a more enveloping sound field is desired.	See below.
Dolby Virtual Speaker Reference	When only two main speakers are present, the Reference mode virtualizes a full surround presentation with accurate localization.	• Dolby Digital (uses only two-speaker mode when signal does not contain center channel information) • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz or 48kHz)
Dolby Virtual Speaker Wide	Wide mode may be used with two main speakers to widen the front soundstage by virtualizing the locations of the left and right speakers.	• Dolby Digital (number of channels available varies by number of channels in signal) • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz or 48kHz)
DTS Digital	Using a different encoding/decoding method than Dolby Digital, it also provides up to five discrete main channels, plus an LFE channel.	• DTS 1/0/.0 or .1, 2/0/.0 or .1, 3/0/.0 or .1, 3/1/.0 or .1, 2/2/.0 or .1, 3/2/.0 or .1 • DTS-ES Matrix (played as 5.1) • DTS-ES Discrete (played as 5.1)

Surround Mode	Description	Incoming Bitstream or Signal
DTS-HD	DTS-HD is a new high-definition audio format that complements the high-definition video found on Blu-ray Disc and HD-DVD discs. It is transmitted using a DTS core with high-resolution extensions. Even when only DTS 5.1 surround sound is desired (or available, if the multizone system is in use), the higher capacity of high-resolution discs serves up DTS at twice the bit rate used on DVD-Video discs.	• Blu-ray Disc or HD-DVD discs encoded with DTS-HD modes, delivered via HDMI.
DTS-HD Master Audio	DTS-HD Master Audio technology delivers bit-for-bit reproductions of the studio master recording in up to 7.1 channels, for an incredibly accurate performance.	• Blu-ray Disc or HD-DVD discs encoded with DTS-HD Master Audio technology, delivered via HDMI.
DTS-ES Matrix	DTS Extended Surround adds a single surround back channel to DTS 5.1 digital surround sound. The Matrix version includes the surround back channel information "matrixed" into the left and right (side) surround channels, for compatibility with 5.1-channel systems.	• DTS-ES Matrix
DTS-ES Discrete	DTS-ES Discrete is another Extended Surround mode that adds a surround back channel, but this information is encoded discretely on the disc, and is not derived from information contained in the surround channels.	• DTS-ES Discrete
DTS Stereo	Delivers a 2-channel downmix of DTS Digital materials, or presents a matrix-encoded surround presentation.	• DTS 1/0/.0 or .1, 2/0/.0 or .1, 3/0/.0 or .1, 3/1/.0 or .1, 2/2/.0 or .1, 3/2/.0 or .1 • DTS 96/24 • DTS-ES Matrix • DTS-ES Discrete
DTS Neo:6 Mode Group	DTS Neo:6 analog processing is available with DTS and DTS 96/24 signals and 2-channel analog or PCM signals to create a 3-, 5- or 6-channel presentation.	See below.
DTS Neo:6 Cinema	Depending on the number of speakers in your system, select 3-, 5- or 6-channel modes, enhanced for movie or video presentations.	• DTS 2/2/.0 or .1, 3/2/.0 or .1 • DTS 96/24 • Analog (2-channel) • PCM (32kHz, 44.1kHz or 48kHz)
DTS Neo:6 Music	Available only in 5- and 6-channel modes, creates a surround presentation suitable for music recordings.	• DTS 2/2/.0 or .1, 3/2/.0 or .1 • DTS 96/24 • Analog (2-channel) • PCM (32kHz, 44.1kHz or 48kHz)
Logic 7 Mode Group	A Harman International proprietary technology, Logic 7 technology enhances 2-channel and matrix-encoded recordings by deriving separate information for the surround back channels. This provides more accurate placement of sound, improves panning and expands the sound field, even when used with 5.1-channel systems. Logic 7 technology uses 96kHz processing, and is available in 5.1- or 7.1-channel modes. Three variants are available.	See below.
Logic 7 Movie	Especially suited to 2-channel sources containing Dolby Surround or matrix encoding, Logic 7 Movie mode increases center channel intelligibility.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Logic 7 Music	The AVR 354 is programmed at the factory to default to this mode for 2-channel signals. Logic 7 Music mode is well suited to conventional 2-channel music recordings.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)

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Surround Mode	Description	Incoming Bitstream or Signal
Logic 7 Game	Use Logic 7 Game mode to enhance enjoyment of video game consoles.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
5-Channel Stereo	Useful for parties, the left- and right-channel information is played through both the front and surround speakers on each side, while the center speaker plays a summed mono mix.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz or 48kHz)
7-Channel Stereo	Expands the 5-Channel Stereo presentation to include the surround back channels.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz or 48kHz)
2-Channel Stereo	Turns off all surround processing and plays a pure 2-channel signal. The signal is digitized and bass management settings are applied, making it appropriate when a subwoofer is used.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
2-Channel Stereo (Analog Bypass)	Maintains an analog input signal in that form, bypassing all digital processing (i.e., surround and bass management). Requires Tone Control setting to be off.	• Analog (2-channel) • Tuner

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Refer to the numbered buttons in Figure 77 when using the Function List.

Figure 77 – Remote Control Function List Reference

APPENDIX

Table A13 – Remote Control Function List

No.	Button Name	AVR	Radio			DVD	Media Server	TV	The Bridge
			FM	AM	XM		DMC1000		
01	AVR Power On	AVR Power On	AVR Power On	AVR Power On	AVR Power On	AVR Power On	AVR Power On	AVR Power On	AVR Power On
02	AVR Power Off	AVR Power Off	AVR Power Off	AVR Power Off	AVR Power Off	AVR Power Off	AVR Power Off	AVR Power Off	AVR Power Off
03	Device Power On					Power On	On	Power On	Power On
04	Device Power Off					Power Off	Off	Power Off	Power Off
05	CBL/SAT	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
06	DVD	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
07	The Bridge	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
08	Radio	Radio	Radio	Radio	Radio	Radio	Radio	Radio	Radio
09	TV	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
10	Game	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
11	Media Server	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
12	AUX	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
13	Audio Effects	Audio Effects	Audio Effects	Audio Effects	Audio Effects	Audio Effects	Audio Effects	Audio Effects	Audio Effects
14	Video Modes	Video Modes	Video Modes	Video Modes	Video Modes	Video Modes	Video Modes	Video Modes	Video Modes
15	Surround Modes	Surround Modes	Surround Modes	Surround Modes	Surround Modes	Surround Modes	Surround Modes	Surround Modes	Surround Modes
16	1	1	1	1	1	1	1	1	1
17	2	2	2	2	2	2	2	2	2
18	3	3	3	3	3	3	3	3	3
19	4	4	4	4	4	4	4	4	4
20	5	5	5	5	5	5	5	5	5
21	6	6	6	6	6	6	6	6	6
22	7	7	7	7	7	7	7	7	7
23	8	8	8	8	8	8	8	8	8
24	9	9	9	9	9	9	9	9	9
25	Last	Last	Last	Last	Last			Prev. Ch	Last
26	0	0	0	0	0	0	0	0	0
27	Activity	Activity	Activity	Activity	Activity	Activity	Activity	Activity	Activity
28	Back/Exit	Back/Exit	Back/Exit	Back/Exit	Back/Exit	Clear	Back		Back/Exit
29	Menu	Menu	Menu	Menu	Menu	Menu	Menu	Menu	Menu
30	Up	Up	Tune Up	Tune Up	Channel/Preset Up	Up	Up	Up	Up
31	Left	Left	Preset/Down	Preset/Down	Preset/Category Down	Left	Left	Left	Left
32	OK	OK	OK	OK	OK	Enter	Enter	OK	OK
33	Right	Right	Preset/Up	Preset/Up	Preset/Category Up	Right	Right	Right	Right
34	Light	Light	Light	Light	Light	Light	Light	Light	Light
35	Down	Down	Tune Down	Tune Down	Channel/Preset Down	Down	Down	Down	Down
36	Disc Menu					Disc Menu	Disc Menu	OSD	
37	Red					Angle	Angle		
38	Green					Subtitle	Subtitle		
39	Yellow					Audio	Audio		
40	Blue					Zoom	Zoom		
41	Volume +	AVR Volume +	AVR Volume +	AVR Volume +	AVR Volume +	AVR Volume +	AVR Volume +	AVR Volume +	AVR Volume +
	Volume –	AVR Volume –	AVR Volume –	AVR Volume –	AVR Volume –	AVR Volume –	AVR Volume –	AVR Volume –	AVR Volume –
42	Mute	AVR Mute	AVR Mute	AVR Mute	AVR Mute	AVR Mute	AVR Mute	AVR Mute	AVR Mute
43	Channel/Page Up	Channel/Preset Up	Preset Up	Preset Up	Preset Up	Page Up		Channel Up	Page Up
	Channel/Page Down	Channel/Preset Down	Preset Down	Preset Down	Preset Down	Page Down		Channel Down	Page Down
44	Previous					Prev. Step	Previous		Previous
45	Pause					Pause	Pause		Pause
46	Next					Next Step	Next Step		Next
47	Rew ◄◄					Rew ◄◄	Rew ◄◄		Rew ◄◄
48	Play ►					Play ►	Play ►		Play ►
49	FF ►►					FF ►►	FF ►►		FF ►►
50	Record						Record		
51	Stop					Stop	Stop		Stop
52	AVR Settings	AVR Settings	AVR Settings	AVR Settings	AVR Settings	AVR Settings	AVR Settings	AVR Settings	AVR Settings
53	Info Settings	Info Settings	Info Settings	Info Settings	Info Settings	Info Settings	Info Settings	Info Settings	Info Settings
54	Source Settings					Setup	Setup	TV/VCR	
55	Sleep	Sleep	Sleep	Sleep	Sleep	Sleep	Sleep	Sleep	Sleep
56	Zone Select	Zone Select	Zone Select	Zone Select	Zone Select	Zone Select	Zone Select	Zone Select	Zone Select
57	Learn	Learn	Learn	Learn	Learn	Learn	Learn	Learn	Learn

Table A13 – continued

No.	Button Name	CBL/SAT	Game	AUX				
				CD	HDTV	PVD	TiVO	VCR
01	AVR Power On	AVR Power On	AVR Power On	AVR Power On	AVR Power On	AVR Power On	AVR Power On	AVR Power On
02	AVR Power Off	AVR Power Off	AVR Power Off	AVR Power Off	AVR Power Off	AVR Power Off	AVR Power Off	AVR Power Off
03	Device Power On	Power On	Play	Power On	Power On	Power On	Power On	Power On
04	Device Power Off	Power Off	Stop	Power Off	Power Off	Power Off	Power Off	Power Off
05	CBL/SAT	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
06	DVD	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
07	The Bridge	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
08	Radio	Radio	Radio	Radio	Radio	Radio	Radio	Radio
09	TV	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
10	Game	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
11	Media Server	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
12	AUX	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel	Input Sel
13	Audio Effects	Audio Effects	Audio Effects	Audio Effects	Audio Effects	Audio Effects	Audio Effects	Audio Effects
14	Video Modes	Video Modes	Video Modes	Video Modes	Video Modes	Video Modes	Video Modes	Video Modes
15	Surround Modes	Surround Modes	Surround Modes	Surround Modes	Surround Modes	Surround Modes	Surround Modes	Surround Modes
16	1	1	1	1	1	1	1	1
17	2	2	2	2	2	2	2	2
18	3	3	3	3	3	3	3	3
19	4	4	4	4	4	4	4	4
20	5	5	5	5	5	5	5	5
21	6	6	6	6	6	6	6	6
22	7	7	7	7	7	7	7	7
23	8	8	8	8	8	8	8	8
24	9	9	9	9	9	9	9	9
25	Last	Prev. Ch	Enter		Prev. Ch	Instant Replay	Enter/Last	
26	0	0	0	0	0	0	0	0
27	Activity	Activity	Activity	Activity	Activity	Activity	Activity	Activity
28	Back/Exit	Bypass	Clear		Exit/Cancel	Exit	Exit	Cancel
29	Menu	Menu	Start		Menu	Menu	Menu	Menu
30	Up	Up	Up		Up	Up	Up	Up
31	Left	Left	Left		Left	Left	Left	Left
32	OK	OK	Select		Enter	Setup	Select	Enter
33	Right	Right	Right		Right	Right	Right	Right
34	Light	Light	Light	Light	Light	Light	Light	Light
35	Down	Down	Down		Down	Down	Down	Down
36	Disc Menu	OSD	DVD Menu		OSD	AV	TiVo	OSD
37	Red	Guide	•	Open/Close	Caption	Mark	Window	
38	Green	PPV	n	Random Play	Fav. Ch	Repeat	Live TV	
39	Yellow	Fav. Ch	s	Repeat	MTS	Jump Up	Slow	
40	Blue	Music	X	Intro Scan	Aspect	Jump Down	Skip	
41	Volume +	AVR Volume +	AVR Volume +	AVR Volume +	AVR Volume +	AVR Volume +	AVR Volume +	AVR Volume +
	Volume –	AVR Volume –	AVR Volume –	AVR Volume –	AVR Volume –	AVR Volume –	AVR Volume –	AVR Volume –
42	Mute	AVR Mute	AVR Mute	AVR Mute	AVR Mute	AVR Mute	AVR Mute	AVR Mute
43	Channel/Page Up	Channel Up	Scan Up	(+10)	Channel Up	Channel Up	Channel Up	Channel Up
	Channel/Page Down	Channel Down	Scan Down	Disc Skip	Channel Down	Channel Down	Channel Down	Channel Down
44	Previous		Slow Down	Skip Down	Back	Last Clip	Thumb Down	Scan Down
45	Pause		Pause	Pause	Pause	Pause	Pause	Pause
46	Next		Slow Up	Skip Up	Replay	Next Clip	Thumb Up	Scan Up
47	Rew ◄◄		Prev.	R. Search	Rew ◄◄	Rew ◄◄	Rew ◄◄	Rew ◄◄
48	Play ►		Play ►	Play ►	Play ►	Play ►	Play ►	Play ►
49	FF ►►		Next	F. Search	FF ►►	FF ►►	FF ►►	FF ►►
50	Record		Subtitle	Time	Record	Record	Record	Record
51	Stop		Stop	Stop	Stop	Stop	Stop	Stop
52	AVR Settings	AVR Settings	AVR Settings	AVR Settings	AVR Settings	AVR Settings	AVR Settings	AVR Settings
53	Info Settings	Info Settings	Info Settings	Info Settings	Info Settings	Info Settings	Info Settings	Info Settings
54	Source Settings	TV/CATV	Program		TV/VCR	TV/DVR	TV Input	TV/VCR
55	Sleep	Sleep	Sleep	Sleep	Sleep	Sleep	Sleep	Sleep
56	Zone Select							
57	Learn	Learn	Learn	Learn	Learn	Learn	Learn	Learn

APPENDIX

Refer to Tables A14 through A24 when programming the codes for your components into the remote.

Table A14 – Remote Control Product Codes: **TV**

TV Manufacturer/Brand	Setup Code Number
AIWA	027
A MARK	122 132
ADMIRAL	192
AKAI	123 160
AMPRO	164
ANAM	045 106 109 112 122
AOC	122 123 128
BLAUPUNKT	084
BROKSONIC	205 206
CANDLE	123 128
CAPEHART	059
CENTURION	123 171
CENTRONIC	045
CITIZEN	045 123 128 132
CLASSIC	045
CONCERTO	128
CONTEC	045
CORANDO	172
CORONADO	132
CRAIG	045 157 158 159
CROWN	045 132
CURTIS MATHES	123 128 132
CXC	045
DAEWOO	045 087 102 105 106 108 111 114 116 119 127 128 132
DAYTRON	128 132
DIGI LINK	200
DYNASTY	045
DYNATECH	063
ELECTROHOME	115 132
EMERSON	045 123 128 132 139 157 158 159 162 205
FUNAI	045
FUTURETECH	045
GE	029 087 121 123 128 133 145 159 163
GRUNDIG	193
HALL MARK	128
HARMAN KARDON	201
HITACHI	123 128 132 144 147
INFINITY	148
INKEL	120
JBL	148
JC PENNEY	115 123 128 132 145
JENSEN	019
JVC	079 087 134
KAWASHO	173
KEC	045
KENWOOD	123 204
KMC	132
KTV	045 123 132 162

TV Manufacturer/Brand	Setup Code Number
LG/GOLDSTAR	101 110 122 128 132
LLOYTRON	172 173
LODGENET	069
LOGIK	069
LUXMAN	128
LXI	077 145 148
MAGNAVOX	030 123 128 132 145 148
MARANTZ	115 123 148
MATSUI	148
MEMOREX	069 128
METZ	084
MGA	115 123 128
MINERVA	084
MITSUBISHI	077 115 123 128 160 167 168
MTC	175 176
NATIONAL	148 177 179 180 181 182
NEC	115 121 123 125
NIKEI	045
ONKING	045
ONWA	045
OPTONICA	077
ORION	207 208 209 210 211
PANASONIC	087 148 169
PHILCO	045 115 123 128 132 148
PHILIPS	033 034 035 036 123 128 132 145 148
PIONEER	024 123 128
PORTLAND	128 132
PROSCAN	133
PROTON	059 122 128 132 165
QUASAR	032 087
RADIO SHACK	045 128 132 180 196 197
RCA	021 115 123 128 133 145 161 163
REALISTIC	045 167 196
RUNCO	152 153
SAA	183
SAMPO	059 123 128
SAMSUNG	020 022 124 128 132 145
SANYO	026 054
SCOTT	045 128 132
SEARS	128 132 145
SHARP	077 128 132
SIEMENS	084
SIGNATURE	069
SONY	028 031 117 130 136 194 212
SOUNDESIGN	045 128
SPECTRICON	122
SSS	045
SYLVANIA	025 123 128 145 148
SYMPHONIC	184
TANDY	077

Table A14 – continued

TV Manufacturer/Brand	Setup Code Number
TATUNG	063
TECHNICS	181
TECHWOOD	128
TEKNIKA	045 069 115 123 128 132
TELERENT	069
TERA	156
THOMSON	190 191
TMK	128
TOSHIBA	063 129 202
TOTEVISION	132
VIDEO CONCEPTS	160
VIDTECH	128
WARDS	069 128 132 148
YAMAHA	123 128
YORK	128
YUPITERU	045
ZENITH	069 090
ZONDA	122

Table A15 – Remote Control Product Codes: **AUX-HDTV**

TV Manufacturer/Brand	Setup Code Number
LG	604
MOTOROLA	605
RCA	601
SAMSUNG	603
ZENITH	602

Table A16 – Remote Control Product Codes: **AUX-VCR**

VCR Manufacturer/Brand	Setup Code Number
AIWA	340
AKAI	348 408 409 426
AMPRO	376
ASA	434
AUDIO DYNAMICS	318 348
BROKSONIC	410 447
CANDLE	434 435
CANON	435 440
CAPEHART	394
CITIZEN	434
CRAIG	345 416
DAEWOO	317 394 404
DAYTRON	394
DBX	318 348
DIRECTV	314 315
DYNATECH	340
EMERSON	313 340 342 410 412
FISHER	317
FUNAI	340
GE	376 395 424
GO VIDEO	413
HARMAN KARDON	302 303 318 349
HITACHI	340 348
JC PENNEY	318 345
JENSEN	348
JVC	318 348 411 432
KENWOOD	320 348
LG/GOLDSTAR	318 407
LLOYD	340
LXI	320 340
MAGIN	345
MAGNAVOX	340
MARANTZ	318
MEMOREX	317 320 340 352 353 354 376
MGA	349
MITSUBISHI	349 431
MULTITECH	340
NAD	439
NATIONAL	440
NEC	318 348
NORDMENDE	348
OPTIMUS	459
ORION	447
PANASONIC	425 450 467 472
PHILCO	340
PHILIPS	340 375
PORTLAND	394
PULSAR	376
QUASAR	301 425
RADIO SHACK	355 434 440 442 458 459
RCA	395 424 425 457 472
REALISTIC	317 320 340 345 459

Table A16 – continued

VCR Manufacturer/Brand	Setup Code Number
SALORA	320
SAMSUNG	345 351 395 405 409
SANSUI	348 416 447
SANYO	317 320
SCOTT	410 412
SEARS	317 320
SHARP	429 456
SONY	380 429
SOUNDESIGN	340
SYLVANIA	340
SYMPHONIC	340
TANDY	317 340
TASHICO	434
TATUNG	348
TEAC	340 348
TEKNIKA	340
THOMAS	340
TiVo	304 305 306 307 308 309 310 311 312
TMK	313
TOSHIBA	412 455
TOTEVISION	345
UNITECH	345
VECTOR RESEARCH	318
VIDEO CONCEPTS	318 340
VIDEOSONIC	345
WARDS	340 345 412
YAMAHA	318 340 348
ZENITH	340 350 376 383

Table A17 – Remote Control Product Codes: **AUX-CD**

CD Manufacturer/Brand	Setup Code Number
ADCOM	063 069
AIWA	072 111 118 156 170
AKAI	050 177 184
AUDIO TECHNICA	053
AUDIOACCESS	125
AUDIOFILE	211
BSR	044
CALIFORNIA AUDIO	109
CAPETRONIC	070
CARRERA	087
CARVER	136 140 141 143 144 145 185 186
CASIO	117 166
CLARINETTE	166
DENON	187 188 213
EMERSON	052 093 108
FISHER	055 095
FRABA	117
FUNAI	126
GE	164
GENEXXA	108
HAITAI	099 214
HARMAN KARDON	001 002 025 054 190
HITACHI	093
INKEL	216
JC PENNEY	098 147
JENSEN	153
JVC	176 195 196
KENWOOD	030 062 078 079 148 151 176 178 181
LG/GOLDSTAR	016 087
LOTTE	108
LUXMAN	077 102
LXI	164
MAGNAVOX	039 113
MARANTZ	058 084 191 192 193
MCINTOSH	194
MCS	080 098
MITSUMI	152
MODULAIRE	166
NAD	013 074 197 198
NAKAMICHI	199 200 201
NEC	069
NIKKO	053 055
ONKYO	037 038 045 046 171 175 202 203
OPTIMUS	065 089 091 092 099 104 212
PANASONIC	075 109 119 158 183 204
PHILIPS	039 138 149 209
PIONEER	071 094 100 112 123 131 161 162 215
PROTON	210
QUASAR	109
RADIO SHACK	126 166 213

Table A17 – continued

CD Manufacturer/Brand	Setup Code Number
RCA	024 081 093 150
RCX	169
REALISTIC	058 093 095 104 105 108 164 166
SANSUI	047 081 134 157 172
SANYO	033 082 095
SCOTT	108
SHARP	058 105 114 151 159 167 180 181
SHERWOOD	003 041 058 105 133
SONY	103 115 116 118 132 139 163 205 206 207 208 212 217
SOUNDSTREAM	124
SYMPHONIC	059 110
TAEKWANG	177
TEAC	011 058 085 086 106 107 110 121 137 146 154
THETA DIGITAL	039
TOSHIBA	013 074 097 151 155 173
VECTOR RESEARCH	087
VICTOR	120 130
WARDS	095
YAMAHA	019 031 053 061 135 169
YORK	166

Table A18 – Remote Control Product Codes: **DVD**

DVD Manufacturer/Brand	Setup Code Number
APEX DIGITAL	061
DENON	019 051
GE	003 004
HARMAN KARDON	001 002 007 068 201 202
JVC	006
LG/GOLDSTAR	005 055 064 066
MAGNAVOX	056
MARANTZ	059
MITSUBISHI	023
NAD	062
ONKYO	009 048
PANASONIC	024 030 044
PHILIPS	056
PIONEER	041 065
PROCEED	060
PROSCAN	003 004
RCA	003 004
SAMSUNG	053 054
SHARP	028
SONY	043 045
THOMSON	003 004
TOSHIBA	009 058 067
YAMAHA	030 063
ZENITH	005 055 064

Table A19 – Remote Control Product Codes: **SAT**

SAT Manufacturer/Brand	Setup Code Number
ALPHASTAR	472
ALPHASTAR DBS	450
ALPHASTAR DSR	442
BIRDVIEW	425
CHANNEL MASTER	320 321 325 361
CHAPARRAL	315 316 451
CITOH	360
DRAKE	313 317 318 413 481
DX ANTENNA	331 352 379 483
ECHOSTAR	395 397 452 453 463 477 478 484 485
ELECTRO HOME	392
FUJITSU	324 329 334
GENERAL INSTRUMENT	303 311 323 365 403 454 468 474
HITACHI DBS	455
HOUSTON TRACKER	463
HUGHES	437 489
JANIEL	366
JERROLD	454 468 484
KATHREIN	410
LEGEND	453
MACOM	317 365 369 370 371
MAGNAVOX	461 473
MEMOREX	453
NEXTWAVE	423
NORSAT	373
OPTIMUS	466
PACE DSS	487
PANASONIC	366 469
PANASONIC DBS	457
PANSAT	420
PERSONAL CABLE	418
PHILIPS	375
PICO	407
PRESIDENT	381 404
PRIMESTAR	412 454 468 475
RCA	301 439 465 490
RCA DSS	458
REALISTIC	349 480
SAMSUNG	442
SATELLITE SERVICE CO	335 388
SCIENTIFIC ATLANTA	339
SONY	405
STAR CHOICE DBS	459
STARCAST	347
SUPER GUIDE	327 423
TELECOM	330 333 390 391 393 409
TOSHIBA	302 426 460 461 462 470
UNIDEN	323 332 348 349 350 351 354 355 381 383 389 403 466 479 480
ZENITH	384 385 387 394 419 488

Table A20 – Remote Control Product Codes: **GAME**

Game Manufacturer/Brand	Setup Code Number
MICROSOFT (XBOX)	001
SONY (PLAYSTATION 2)	002

Table A21 – Remote Control Product Codes: **CBL**

CBL Manufacturer/Brand	Setup Code Number
ABC	001 011
ALLEGRO	111
AMERICAST	212
ARCHER	112
BELCOR	113
CABLE STAR	033 113
CITIZEN	111
COLOUR VOICE	085 090
DIGI	114
EAGLE	186
EASTERN	066 070
ELECTRICORD	039
EMERSON	112
FOCUS	116
G.I.	001 011 017 096 097
GC ELECTRONICS	113
GEMINI	032 060
GENERAL	210
GENERAL INSTRUMENT	210
GOODMIND	112
HAMLIN	056 099 100 101 117 175 208
HITACHI	001 188
JASCO	111
JERROLD	001 002 011 017 073 096 097 162 188 210
LINDSAY	118
MACOM	191
MAGNAVOX	017 019 068
MOVIE TIME	035 039
NSC	035 190
OAK	197 220
PACE	179
PANASONIC	053 176 177 189 214
PANTHER	114
PHILIPS	013 019 020 085 090
PIONEER	001 041 119 171 209 215 216
POPULAR MECHANICS	116
PRELUDE	120
PRIMESTAR	162
RADIO SHACK	111 112 213
RCA	053 214
RECOTON	116
REGAL	056 099 100 101 208
REMBRANT	032
SAMSUNG	003 072 186

Table A21 – continued

CBL Manufacturer/Brand	Setup Code Number
SCIENTIFIC ATLANTA	183 203 221 222
SEAM	121
SIGNATURE	001 188
SPRUCER	053 081 177 189
STARCOM	002 011 163
STARGATE	120
TANDY	024
TELECAPATION	028
TEXSCAN	036
TFC	122
TIMELESS	123
TOCOM	170 205
UNITED CABLE	011
UNIVERSAL	033 034 039 042 113
VIDEOWAY	124 211
VIEWSTAR	019 025 086 089 190
ZENITH	065 125 211 219
ZENTEK	116

Table A22 – Remote Control Product Codes: **AUX-MEDIA SERVER**

Manufacturer/Brand	Setup Code Number
HARMAN KARDON	002

Table A23 – Remote Control Product Codes: **AUX-CBL/SAT RECORDER (PVD)**

Manufacturer/Brand	Setup Code Number
DAEWOO	701 704
ECHOSTAR	714 715 716
EXPRESSVU	714
HUGHES	717 727
HYUNDAI	718
KEEN	709
PANASONIC	710 723
PHILIPS	711 717 724 727
PROSCAN	719
RCA	719 727
REPLAYTV	708 710 712 725 726
SONICBLUE	710 712
SONY	707 713 720 721 722 723 724

Table A24 – Remote Control Product Codes: **AUX- TiVo**

Manufacturer/Brand	Setup Code Number
DIRECTV	806 (See also Table A16)
PIONEER	801
SERIES 2 DVR	802 809
TOSHIBA	803
OTHER TiVo	804 805 807 808 810

AVR 354 TECHNICAL SPECIFICATIONS

Audio Section

Stereo Mode

Continuous Average Power (FTC)

75 Watts per channel, 20Hz–20kHz,
@ <0.07% THD, both channels driven into 8 ohms

Seven-Channel Surround Modes
Power per Individual Channel

Front L & R channels:
75 Watts per channel
@ <0.07% THD, 20Hz–20kHz into 8 ohms

Center channel:
75 Watts @ <0.07% THD, 20Hz–20kHz into 8 ohms

Surround (L & R Side, L & R Back) channels:
75 Watts per channel
@ <0.07% THD, 20Hz–20kHz into 8 ohms

Input Sensitivity/Impedance	
Linear (High-Level)	200mV/47k ohms
Signal-to-Noise Ratio (IHF-A)	100dB
Surround System Adjacent Channel Separation	
Pro Logic® I/II	40dB
Dolby® Digital (AC-3)	55dB
DTS®	55dB
Frequency Response	
@ 1W (+0dB, –3dB)	10Hz – 130kHz
High Instantaneous Current Capability (HCC)	±35 Amps
Transient Intermodulation Distortion (TIM)	Unmeasurable
Slew Rate	40V/µsec

FM Tuner Section

Frequency Range	87.5–108.0MHz
Usable Sensitivity	IHF 1.3µV/13.2dBf
Signal-to-Noise Ratio	Mono/Stereo 70/68dB
Distortion	Mono/Stereo 0.2/0.3%
Stereo Separation	40dB @ 1kHz
Selectivity	±400kHz, 70dB
Image Rejection	80dB
IF Rejection	90dB

Please register your AVR 354 at **www.harmankardon.com.**

NOTE: You'll need the product's serial number. At the same time, you can choose to be notified about new products and/or special promotions.

AM Tuner Section

Frequency Range	520–1720kHz
Signal-to-Noise Ratio	45dB
Usable Sensitivity	Loop 500µV
Distortion	1kHz, 50% Mod 0.8%
Selectivity	±10kHz, 30dB

Video Section

Television Format	NTSC
Input Level/Impedance	1Vp-p/75 ohms
Output Level/Impedance	1Vp-p/75 ohms
Video Frequency Response (Composite and S-Video)	10Hz–8MHz (–3dB)
Video Frequency Response (Component Video)	10Hz–100MHz (–3dB)
HDMI™	Version 1.3a with 10-bit Deep Color

General

Power Requirement	AC 120V/60Hz	
Power Consumption	118W idle, 890W maximum (7 channels driven)	
Dimensions	(Product)	(Shipping)
Width	17-5/16 inches (440mm)	21-7/8 inches (555mm)
Height	6-1/2 inches (165mm)	10-1/2 inches (266mm)
Depth	15 inches (382mm)	18-5/16 inches (465mm)
	(Product)	(Shipping)
Weight	31.5 lb (14.3kg)	36.7 lb (16.7kg)

Depth measurement includes knobs, buttons and terminal connections.
Height measurement includes feet and chassis.
All features and specifications are subject to change without notice.

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